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THE NEW IMPERIAL ENCYCLOPEDIA AND DICTIONARY

A LIBRARY OF UNIVERSAL KNOWLEDGE AND AN UNABRIDGED DICTIONARY OF THE ENGLISH LANGUAGE UNDER ONE ALPHABET

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(Formerly Editor-in-Chief of the International Cyclopedia)

Assisted by a large corps of trained cyclopedists

IN FORTY VOLUMES

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SCHEME OF SOUND SYMBOLS

FOR THE PRONUNCIATION OF WORDS.

Note.—(-) is the mark dividing words respelt phonetically into syllables; (′), the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
ā	mate, fate, fail, aye	*māt, fāt, fāl, ā.*
ă	mat, fat	*măt, făt.*
â	far, calm, father	*fâr, kâm, fâ′thėr.*
ä	care, fair	*cär, fär.*
aw	fall, laud, law	*fawl, lawd, law.*
ē	mete, meat, feet, free	*mēt, mēt, fēt, frē.*
ĕ	met, bed	*mĕt, bĕd.*
ė	her, stir, heard, cur	*hėr, stėr, hėrd, kėr.*
ī	pine, ply, height	*pīn, plī, hīt.*
ĭ	pin, nymph, ability	*pĭn, nĭmf, ă-bĭl′ĭ-tĭ.*
ō	note, toll, soul	*nōt, tōl, sōl.*
ŏ	not, plot	*nŏt, plŏt.*
ô	move, smooth	*môv, smôth.*
ö	Goethe (similar to *e* in her)	*gö′tėh.*
ow	noun, bough, cow	*nown, bow, kow.*
oy	boy, boil	*boy, boyl.*
ū	pure, dew, few	*pūr, dū, fū.*
ŭ	bud, come, tough	*bŭd, kŭm, tŭf.*
û	full, push, good	*fûl, pûsh, gûd.*
ü	French plume, Scotch guid	*plüm, güd.*
ch	chair, match	*chär, măch.*
ċh	German buch, Heidelberg, Scotch loch (guttural)	*bôċh, hī′dėl-bĕrċh, lŏċh.*
g	game, go, gun	*gām, gō, gŭn.*
j	judge, gem, gin	*jŭj, jĕm, jĭn.*
k	king, cat, cot, cut	*kĭng, kăt, kŏt, kŭt.*
s	sit, scene, cell, city, cypress	*sĭt, sēn, sĕl, sĭt′ĭ, sī′prĕs.*
sh	shun, ambition	*shŭn, ăm-bĭsh′ŭn.*
th	thing, breath	*thĭng, brĕth.*
th	though, breathe	*thō, brēth.*
z	zeal, maze, muse	*zēl, māz, mūz.*
zh	azure, vision	*ăzh′ėr, vĭzh′ŭn.*

ABBREVIATIONS USED IN THIS WORK.

a., *or* adj....adjective
A.B.....Bachelor of Arts
abbr.....abbreviation, abbreviated
abl. *or* abla.ablative
Abp.....Archbishop
abt.....about
Acad.....Academy
acc. *or* ac..accusative
accom.....accommodated, accommodation
act.....active
A.D.....in the year of our Lord [*Anno Domini*]
Adjt .....Adjutant
Adm .....Admiral
adv. *or* ad..adverb
A. F.....Anglo-French
Ag.....Silver [*Argentum*]
agri.....agriculture
A. L.....Anglo-Latin
Al.....Aluminium
Ala.....Alabama
Alb.....Albanian
alg.....algebra
A.M.....before noon [*ante meridiem*]
A.M. .....Master of Arts
Am.....Amos
Amer.....America, -n
anat.....anatomy, anatomical
anc.....ancient, anciently
AN. M.. ....in the year of the world [*Anno Mundi*
anon.....anonymous
antiq.....antiquity, antiquities
aor.....aorist, -ic
app.....appendix
appar.....apparently
Apr.....April
Ar.....Arabic
arch.....architecture
archæol....archæology
arith.....arithmetic
Ariz.....Arizona
Ark.....Arkansas
art.....article
artil..... artillery
AS.....Anglo-Saxon
As.....Arsenic
Assoc.....Association
asst.....assistant
astrol.....astrology
astron... ..astronomy
attrib.....attributive
atty.....attorney
at. wt.....atomic weight
Au.....Gold [*Aurum*]
A.U.C.....in the year of the building of the city (Rome) [*Annourbis conditæ*]
Aug.....August
aug.....augmentative
Aust.....Austrian
A. V.....authorized version [of Bible, 1611]
avoir.....avoirdupois
B .....Boron
B.....Britannic
b.....born
Ba .....Barium
Bart .....Baronet
Bav.....Bavarian
bl.; bbl....barrel; barrels
B.C.....before Christ
B.C.L.... ...Bachelor of Civil Law
B.D.....Bachelor of Divinity
bef.....before
Belg.....Belgic
Beng..... .Bengali
Bi.....Bismuth
biog.....biography, biographical
biol.....biology
B.L.....Bachelor of Laws
Bohem.....Bohemian
bot.....botany, botanical
Bp .....Bishop
Br.....Bromine
Braz .....Brazilian
Bret.....Breton
Brig.....Brigadier
Brit.....British, Britannica
bro .....brother
Bulg.....Bulgarian
bush.....bushel, bushels
C.....Carbon
c.....century
Ca .....Calcium
Cal.. .....California
Camb.....Cambridge
Can.....Canada
Cant.....Canterbury
cap.....capital
Capt.....Captain
Card... ....Cardinal
carp.....carpentry
Cath.....Catholic
caus.....causative
cav.....cavalry
Cd.....Cadmium
Ce .....Cerium
Celt.....Celtic
cent.....central
cf.....compare [*confer*]
ch *or* chh...church

Chal.....Chaldee
chap.....chapter
chem.....chemistry, chemical
Chin.....Chinese
Chron.....Chronicles
chron.....chronology
Cl.....Chlorine
Class.....Classical [= Greek and Latin]
Co.....Cobalt
Co.....Company
co.....county
cog.....cognate [with]
Col.....Colonel
Col.....Colossians
Coll.....College
colloq.....colloquial
Colo.....Colorado
Com.....Commodore
com.....commerce, commercial
com.....common
comp.....compare
comp.....composition, compound
compar....comparative
conch.....conchology
cong.....congress
Congl.....Congregational
conj.....conjunction
Conn *or* Ct.Connecticut
contr.....contraction, contracted
Cop.....Coptic
Cor.....Corinthians
Corn.....Cornish
corr.....corresponding
Cr.....Chromium
crystal.....crystallography
Cs.....Cæsium
ct.....cent
Ct.*or* Conn.Connecticut
Cu.....Copper [*Cuprum*]
cwt.....a hundred weight
Cyc.....Cyclopedia
D.....Didymium
D. *or* Dut..Dutch
d.....died
d. [l. s. d.]..penny, pence
Dan.....Daniel
Dan.....Danish
dat.....dative
dau.....daughter
D. C.....District of Columbia
D.C.L.....Doctor of Civil [or Common] Law
D.D.....Doctor of Divinity
Dec.....December
dec.....declension
def.....definite, definition
deg.....degree, degrees
Del.....Delaware
del.....delegate, delegates
dem.....democratic
dep.....deputy
dep.....deponent
dept.....department
deriv.....derivation, derivative
Deut.....Deuteronomy
dial.....dialect, dialectal
diam.....diameter
Dic.....Dictionary
diff.....different, difference
dim.....diminutive
dist.....district
distrib.....distributive
div.....division
doz.....dozen
Dr.....Doctor
dr.....dram, drams
dram.....dramatic
Dut. *or* D...Dutch
dwt.....pennyweight
dynam *or* dyn.....dynamics
E.....Erbium
E. *or* e.....East, -ern, -ward
E. *or* Eng..English
Eccl.....Ecclesiastes
eccl. *or* eccles.... } ecclesiastical [affairs]
ed.....edited, edition, editor
e.g.....for example [*ex gratia*]
E. Ind. *or* E. I.... } East Indies, East Indian
elect.....electricity
Emp.....Emperor
Encyc.....Encyclopedia
Eng. *or* E..English
engin.....engineering
entom.....entomology
env. ext....envoy extraordinary
ep.....epistle
Eph.....Ephesians
Episc.....Episcopal
eq. *or* =...equal, equals
equiv.....equivalent
esp.....especially
Est.....Esther
estab.....established
Esthon.....Esthonian
etc.....and others like [*et cetera*]
Eth.....Ethiopic
ethnog.....ethnography
ethnol.....ethnology
et seq.....and the following [*et sequentia*]
etym.....etymology
Eur.....European
Ex.....Exodus
exclam.....exclamation
Ezek.....Ezekiel
Ezr.....Ezra
F.....Fluorine
F. *or* Fahr.Fahrenheit
f. *or* fem...feminine
F. *or* Fr....French
fa.....father
Fahr. *or* F.Fahrenheit
far.....farriery
Fe.....Iron [*Ferrum*]
Feb.....February
fem *or* f. ..feminine
fig.....figure, figuratively
Fin.....Finnish
F.—L.....French from Latin
Fla.....Florida
Flem.....Flemish
for.....foreign
fort.....fortification
Fr. *or* F....French
fr.....from

freq.....frequentative
Fris .....Frisian
ft.....foot, feet
fut.....future
G. *or* Ger...German
G.....Glucinium
Ga.....Gallium
Ga.....Georgia
Gael.....Gaelic
Gal.....Galatians
gal.....gallon
galv.....galvanism, galvanic
gard.....gardening
gen.....gender
Gen.....General
Gen .....Genesis
gen..... genitive
Geno.....Genoese
geog .....geography
geol.....geology
geom.....geometry
Ger.....German, Germany
Goth.....Gothic
Gov.....Governor
govt.....government
Gr.....Grand, Great
Gr.....Greek
gr.....grain, grains
gram .....grammar
Gr. Brit....Great Britain
Gris.....Grisons
gun.....gunnery
H.....Hegira
H.....Hydrogen
h.....hour, hours
Hab.....Habakkuk
Hag.....Haggai
H. B. M.....His [or Her] Britannic Majesty
Heb.....Hebrew, Hebrews
her.....heraldry
herpet.....herpetology
Hg.....Mercury [*Hydrargyrum*]
hhd.....hogshead, hogsheads
Hind.....Hindustani, Hindu, or Hindi
hist .....history, historical
Hon .....Honorable
hort.....horticulture
Hos .....Hosea
Hung.....Hungarian
Hydros.....Hydrostatics
I.....Iodine
I.; Is.....Island ; Islands
Icel.....Icelandic
ichth.....ichthyology
Ida.....Idaho
i.e.....that is [*id est*]
Ill.....Illinois
illus.....illustration
impera *or* impr.....imperative
impers.....impersonal
impf *or* imp imperfect
impf. p. *or* imp .....imperfect participle
improp.....improperly
In.....Indium
in... .....inch, inches
incept.....inceptive
Ind .....India, Indian
Ind .....Indiana
ind.....indicative
indef .....indefinite
Indo-Eur...Indo-European
inf.....infantry
inf *or* infin.infinitive
instr.....instrument, -al
int... .....interest
intens.....intensive
interj. *or* int.....interjection
interrog....interrogative pronoun
intr. *or* intrans...intransitive
Io... .....Iowa
Ir..... ..Iridium
Ir.....Irish
Iran.....Iranian
irr .....irregular, -ly
Is.....Isaiah
It.....Italian
Jan.....January
Jap.....Japanese
Jas.....James
Jer.....Jeremiah
Jn.....John
Josh.....Joshua
Jr.....Junior
Judg .....Judges
K.....Potassium [*Kalium*]
K.....Kings [in Bible]
K.....king
Kan.....Kansas
Kt.....Knight
Ky.....Kentucky
L.....Latin
L.....Lithium
l. [l. s. d.], *or* £..... } pound, [sterling] pounds
La.....Lanthanium
La.....Louisiana
Lam.....Lamentations
Lang.....Languedoc
lang... ....language
Lap.....Lapland
lat .....latitude
lb.; llb. *or* lbs..... } pound ; pounds [weight]
Let.....Lettish
Lev . .....Leviticus
LG.....Low German
L.H.D.....Doctor of Polite Literature
Lieut.....Lieutenant
Lim .....Limousin
Lin .....Linnæus, Linnæan
lit .....literal,-ly
lit .....literature
Lith.....Lithuanian
lithog.....lithograph, -y
LL.....Late Latin, Low Latin
LL.D.....Doctor of Laws
long.....longitude
Luth.....Lutheran
M.....Middle
M.....Monsieur
m.....mile, miles
m. *or* masc..masculine
M.A.....Master of Arts
Macc. .....Maccabees
mach... ....machinery
Mag.....Magazine

Maj.....Major
Mal.....Malachi
Mal.....Malay, Malayan
manuf.....manufacturing, manufacturers
Mar.....March
masc *or* m.masculine
Mass.....Massachusetts
math. .....mathematics, mathematical
Matt.....Matthew
M.D..... ...Doctor of Medicine
MD.....Middle Dutch
Md.....Maryland
ME.....Middle English, or Old English
Me.....Maine
mech.....mechanics, mechanical
med.....medicine, medical
mem.....member
mensur....mensuration
Messrs. *or* MM .....Gentlemen, Sirs
metal.....metallurgy
metaph....metaphysics, metaphysical
meteor.....meteorology
Meth.....Methodist
Mex.....Mexican
Mg .....Magnesium
M.Gr .....Middle Greek
MHG.....Middle High German
Mic..... ..Micah
Mich .....Michigan
mid.....middle [voice]
Milan.....Milanese
mid. L. *or* ML..... } Middle Latin, Medieval Latin
milit. *or* mil.... ..military [affairs]
min .....minute, minutes
mineral....mineralogy
Minn.....Minnesota
Min. Plen..Minister Plenipotentiary
Miss.....Mississippi
ML. *or* mid. L... } Middle Latin, Medieval Latin
MLG.....Middle Low German.
Mlle.....Mademoiselle
Mme.....Madam
Mn.....Manganese
Mo.....Missouri
Mo.....Molybdenum
mod.....modern
Mont .....Montana
Mr.....Master [Mister]
Mrs..... .Mistress [Missis]
MS.; MSS..manuscript; manuscripts
Mt.....Mount, mountain
mus.....music
MUS.DOC....Doctor of Music
myth.....mythology, mythological
N.....Nitrogen
N. *or* n.....North, -ern, -ward
n .....noun
n *or* neut...neuter
Na .....Sodium [*Natrium*]
Nah.....Nahum
N. A., *or* N. Amer.North America, -n
nat.....natural
naut.....nautical
nav.....navigation, naval affairs
Nb.....Niobium
N. C. *or* N. Car...North Carolina
N. D.....North Dakota
Neb.....Nebraska
neg.....negative
Neh .....Nehemiah
N. Eng.....New England
neut *or* n...neuter
Nev.....Nevada
N.Gr.....New Greek, Modern Greek
N. H .....New Hampshire
NHG.....New High German [German]
Ni ... .Nickel
N. J.....New Jersey
NL .....New Latin, Modern Latin
N. Mex.....New Mexico
N. T.. *or* N. Test...New Testament
N. Y.....New York [State]
nom.....nominative
Norm. F...Norman French
North. E...Northern English
Norw... ...Norwegian, Norse
Nov.....November
Num.....Numbers
numis.....numismatics
O.....Ohio
O.....Old
O.....Oxygen
Obad.....Obadiah
obj.....objective
obs. *or* †...obsolete
obsoles....obsolescent
O.Bulg.....Old Bulgarian or Old Slavic
Oct.....October
Odontog...odontography
OE.....Old English
OF *or* O. Fr....Old French
OHG.....Old High German
Ont.....Ontario
opt... .....optics, optical
Or.....Oregon
ord .....order
ord.... .. .ordnance
org.....organic
orig.....original, -ly
ornith.....ornithology
Os.....Osmium
OS. ... .Old Saxon
O. T., *or* O. Test...Old Testament
Oxf.....Oxford
oz.....ounce, ounces
P.....Phosphorus
p.; pp.....page; pages
p., *or* part..participle
Pa. *or* Penn.Pennsylvania
paint .....painting
palæon.....palæontology
parl.....parliament
pass.....passive

pathol *or* path.....pathology
Pb.....Lead [*Plumbum*]
Pd .....Palladium
Penn *or* Pa.Pennsylvania
perf .....perfect
perh .....perhaps
Pers.....Persian, Persic
pers.....person
persp.....perspective
pert.....pertaining [to]
Pet.....Peter
Pg. *or* Port.Portuguese
phar.....pharmacy
PH.D .....Doctor of Philosophy
Phen.....Phenician
Phil.....Philippians
Philem.....Philemon
philol. ....philology, philological
philos. *or* phil... { philosophy, philosophical
phonog.....phonography
photog.....photography
phren... ..phrenology
phys.....physics, physical
physiol... .physiology, physiological
Pied .....Piedmontese
Pl ....Plate
pl. *or* plu...plural
Pl. D.....Platt Deutsch
plupf.....pluperfect
P.M.....afternoon[*post meridiem*]
pneum.....pneumatics
P. O.....Post-office
poet.....poetical
Pol.....Polish
pol econ...political economy
polit.....politics, political
pop... ....population
Port. *or* Pg.Portuguese
poss .....possessive
pp.....pages
pp.....past participle, perfect participle
p. pr.....present participle
Pr. *or* Prov.Provençal
pref.....prefix
prep.... ...preposition
Pres.....President
pres .....present
Presb.....Presbyterian
pret.....preterit
prim.....primitive
priv.....privative
prob.....probably, probable
Prof .....Professor
pron.....pronoun
pron.....pronunciation, pronounced
prop.....properly
pros.....prosody
Prot.. .....Protestant
Prov.*or* Pr. Provençal
Prov.....Proverbs
prov.....province, provincial
Prov. Eng..Provincial English
Prus.....Prussia, -n
Ps.....Psalm, Psalms
psychol....psychology

pt.....past tense
pt.....pint
Pt.....Platinum
pub.....published, publisher, publication
pwt.....pennyweight
Q.....Quebec
qt.....quart
qtr..... ...quarter [weight]
qu.....query
q.v.....which see [*quod vide*]
R.....Rhodium
R.....River
Rb. .....Rubidium
R. Cath....Roman Catholic
rec. sec.....recording secretary
Ref..... ..Reformed
refl.....reflex
reg.....regular, -ly
regt.....regiment
rel. pro. *or* rel.....relative pronoun
repr .....representing
repub.....republican
Rev .. ....Revelation
Rev.....The Reverend
Rev. V.....Revised Version
rhet.....rhetoric, -al
R. I.....Rhode Island
R. N.....Royal Navy
Rom .....Roman, Romans
Rom.....Romanic or Romance
Rom. Cath. Ch. *or* R. C. Ch.... { Roman Catholic Church
r.r.....railroad
Rt. Rev ...Right Reverend
Ru .....Ruthenium
Russ.....Russian
r.w.....railway
S.....Saxon
S.....Sulphur
s.....second, seconds
s. [l. s. d.]..shilling, shillings
S. *or* s.....South, -ern, -ward
S. A. *or* S. Amer..South America, -n
Sam .....Samaritan
Sam.....Samuel
Sans, *or* Skr.....Sanskrit
Sb.....Antimony [*Stibium*]
s.c.....understand, supply, namely [*scilicet*]
S. C. *or* S. Car....South Carolina
Scand.....Scandinavian
Scot.....Scotland, Scotch
scr.....scruple, scruples
Scrip.....Scripture [s], Scriptural
sculp.....sculpture
S. D.....South Dakota
Se.....Selenium
sec.... ....secretary
sec.....section
Sem.....Semitic
Sep.....September
Serv.....Servian
Shaks.....Shakespeare
Si .....Silicon

Sic.....Sicilian
sing..... singular
sis.....sister
Skr. *or* Sans.....Sanskirt
Slav.....Slavonic, Slavic
Sn.... .....Tin [*Stannum*]
Soc.....Society
Song Sol...Song of Solomon
Sp.....Spanish
sp. gr.....specific gravity
sq.....square
Sr.....Senior
Sr.....Strontium
St.: Ste....Saint
St.. .....street
stat.....statute
S.T.D.....Doctor of Sacred Theology
subj.....subjunctive
suf.....suffix
Su. Goth...Suo-Gothic
superl.....superlative
Supp.....Supplement
Supt .....Superintendent
surg.....surgery, surgical
Surv.....surveying
Sw.....Swedish
Swab.....Swabian
sym.....symbol
syn.....synonym, -y
Syr.... ....Syriac, Syrian
t .....town
Ta... .....Tantalum
Tart.....Tartar
Te.....Tellurium
technol ... technology
teleg.....telegraphy
Tenn.....Tennessee
term.....termination
terr.....territory
Teut.....Teutonic
Tex.....Texas
Th.....Thorium
theat .....theatrical
theol.....theology, theological
therap.....therapeutics
Thess.....Thessalonians
Ti.....Titanium
Tim.....Timothy
Tit..... ...Titus
Tl.....Thallium
toxicol.....toxicology
tp.....township
tr. *or* trans.transitive
transl.....translation, translated
trigon.....trigonometry
Turk.....Turkish
typog.....typography, typographical
U.....Uranium
ult.....ultimate, -ly
Unit.....Unitarian
Univ.....Universalist
Univ.....University
U. Presb...United Presbyterian
U. S... ....United States
U. S. A.....United States Army
U. S. N.....United States Navy
Ut.....Utah
V.....Vanadium
v.....verb
Va.....Virginia
var.....variant [word]
var..... variety of [species]
Ven.....Venerable
Venet.....Venetian
vet.... ....veterinary
v. i. *or* v. intr....verb intransitive
vil.....village
viz.....namely, to-wit [*videlicet*]
v. n.....verb neuter
voc .....vocative
vol.....volume
vols.....volunteers
Vt.....Vermont
v. tr..... .verb transitive
W.....Tungsten [*Wolfram*]
W . .....Welsh
W. *or* w....West, -ern, -ward
Wal .....Walachian
Wall.....Walloon
Wash.....Washington
Westph....Westphalia, -n
W. Ind. *or* W. I...West Indies, West Indian
Wis.....Wisconsin
wt.....weight
W. Va.....West Virginia
Wyo.....Wyoming
Y..... Yttrium
yd.....yard
yr.....year
Zech.....Zechariah
Zeph. .....Zephaniah
Zn..... ...Zinc
zool.....zoology, zoological
Zr.....Zirconium

See also ABBREVIATIONS: in Vol. I.

IMPERIAL ENCYCLOPEDIA AND DICTIONARY.

TWITTER, v. *twĭt'tĕr* [imitative of sharp broken sounds like the notes of a little bird: Ger. *zwitschern*, to twitter: Swiss, *zwitzern*, to flicker: Bav. *zwitzern*, to gnash the teeth, to tremble: Dut. *kwetteren*, to twitter, chatter]: to make a succession of small tremulous sounds like a swallow or other small bird; to feel a slight trembling of the nerves; in *OE.*, to titter: N. a small tremulous noise, as of a swallow; a slight trembling of the nerves; in *OE.*, a titter. TWIT'TERING, imp.: N. the act of uttering a succession of small sounds. TWIT'TERED, pp. *-tĕrd.*

'TWIXT, *twĭkst:* a contracted form of BETWIXT.

TWO, a. and n. *tô* [AS. *twa;* Ger. *zwei;* Dan. *to;* Dut. *twee;* Goth. *twai;* Ir. and Gael. *da;* Gr. and L. *duo;* Russ. *dwa;* Skr. *dvau*, two]: one and one; the number after one. TWO-EDGED, a. having edges on both sides, as a sword. TWO-FACED, having a face both in front and behind, as the Roman god Janus (q.v.); hence, insincere; given to double-dealing. TWOFOLD, a. two of the same kind: duplicate; pertaining to two different things existing together: AD. in a double degree. TWO-FOOT, a. that can measure two feet. TWO-HANDED, a. requiring two hands to grasp, as a sword; stout and strong; large; dexterous. TWO-MASTED, a. having two masts, as a ship. TWOPENNY, a. *tŭp'pĕn-nĭ*, of the value of *twopence.* TWOPENCE, n. *tŏ'pĕns* or *tŭp'pĕns*, sum amounting to two pennies. TWO-PLY, a. consisting of two thicknesses; consisting of two strands twisted together, as thread. TWO-TONGUED, a. double-tongued; deceitful.

TWYBILL: see TWIBILL.

TWYER, n. *twī'ĕr:* same as TUYERE.

TYBEE, *tī-bē':* island and sound at the mouth of the Savannah river, Georgia. The Sound is a bay of the Atlantic, extending from T. Island on the s. to Hilton Head on the n., opening to Port Royal entrance by Cooper's river, Wall's Cut, Lazaretto creek, and other channels. The island is 6 m. long by 3 wide, and was occupied 1861 by Gen. Sherman, who erected batteries for the reduction of Fort Pulaski, which capitulated 1862, Apr. 11.

TYBURN, *tī'bèrn:* chief place of execution of the death-sentence in London prior to 1783; near the n.e. corner of Hyde Park, w. extremity of Oxford street, where Edgeware and Uxbridge roads unite. T. took its name from a small stream which ran from Hampstead to the Thames through St. James's Park, but which long ago disappeared. The gallows seems to have been a permanent erection, resting on three posts, whence the phrase 'Tyburn's triple tree.' Wooden galleries were erected near for accommodation of spectators. The criminal was conveyed from Newgate to T., about 2 m., by Holborn and the T. road, now Oxford street, but in the 17th c. a 'sloughy country road.' As London spread westward, the long procession became inconvenient, and the place of execution was, 1783, Dec. 9, removed to the Old Bailey, or Newgate, where it continued till the close of 1884.

In early times the frequency of executions rendered the office of executioner more important than it is now. During the reign of Henry VIII. (38 years) the average number of executions in England was 2,000 per annum. In the 19th c. the number has sunk to about 12. The first executioner of whom we have record was 'one Bull,' 1593. He was succeeded by Derrick, referred to in the *Fortunes of Nigel*, and mentioned in a political broadside as living in 1647. In the ballad of *The Penitent Tailor*, pub. in the same year, reference is made to his successor, Gregory Brandon—

> 'I had been better to have lived in beggary,
> Than to have fallen into the hands of Gregory.'

In Gregory's time it was the custom to prefix 'squire' to the names of the T. hangmen. This is said to have originated in a practical joke played on the garter king-of arms. He was induced to certify the authenticity of a coat-of-arms of a gentleman named Gregory Brandon, supposed to reside in Spain, but who turned out to be the 'hangman.' The garter king was sent to prison for his negligence; hence the popular error that 'an executioner who has beheaded a state prisoner becomes an esquire.' Gregory was succeeded by his son Richard. 'Squire Dun' followed; and after him came Jack Ketch, or Squire Ketch, mentioned first 1678. It was he who beheaded Lord Russell and the Duke of Monmouth. Lord Macaulay, in speaking of the latter execution, says: 'He then accosted Jack Ketch, the executioner, a wretch whose name has, during a century and a half, been vulgarly given to all who have succeeded him in his odious office. "Here," said the duke, "are six guineas for you. Do not hack me, as you did my Lord Russell. I have heard that you struck him three or four times. My servant will give you some gold if you do the work well."' (*History of England*, II. 205.) After this time the 'kings of Tyburn' all received the name of Ketch. Jack Ketch's immediate successor was 'one Rose, a butcher;' and the last of the T. hangmen was Edward Dennis, condemned for taking part in the No-Popery Riots, but respited, it is said because his services could not be dispensed with.

Among the most memorable executions at T. were those of Elizabeth Barton, the Holy Maid of Kent, and her confederates (1534); John Felton, murderer of the Duke of Buckingham (1628); Jack Sheppard, the highwayman (1724); Jonathan Wild, the thief-catcher (1725); Mrs. Brownrigg, murderer of an apprentice (1766); Dr. Dodd (q.v.), found guilty of forging a bond for £4,200 (1777); and the Rev. Henry Hackman, murderer of Miss Reay (1779). T. has naturally been avoided as a street-name in London; but it survives in Thackeray, who described a certain quarter of the metropolis as 'the elegant, the prosperous, the polite Tyburnia, the most respectable district in the habitable globe.'—See Chambers's *Book of Days*, II.; *Notes and Queries*, 2d series, II.—See CAPITAL PUNISHMENT: EXECUTIONER: EXECUTION OF THE DEATH-SENTENCE.

TY'BURN-TICKET: a certificate formerly granted in London, under statute William III. (10, 10, c. 23), to a prosecutor who had secured a capital conviction against a criminal, exempting the holder from parish and ward offices with the parish in which the felony had been committed. These tickets were enrolled with the clerk of the peace, and sold like any other property. The privilege that the tickets conferred must have been highly valued, as they sold at a high price. 'Last week,' says the *Stamford Mercury*, 1818, Mar. 27, 'a Tyburn ticket sold in Manchester for £280.' The act under which they were granted was repealed a few months later, 1818, June 3; and they are no longer recognized.—See *Notes and Queries*, 2d series, XI.

TYBURN-TREE, n. *tī'bėrn-trē* [*Tyburn*, London, where felons were formerly hanged]: the gallows (see TYBURN).

TYCOON, n. *tī-kôn'* [Jap. pronunciation of Chinese *ta-kiun*, 'great prince']: the title or style assumed by Iyesada, the Shogun (q.v.) with whom Commodore Perry, on behalf of the United States, concluded a treaty with Japan, and whom both the United States government (in a letter sent by Perry) and Perry himself addressed as 'emperor'—a title to which no shogun had any right, being only a servant of the mikado or emperor. The title *tycoon* was never recognized by the Japanese, but was the common designation of the shogun among foreigners down to the abolition of the shogunate in 1868. Iyesada, however, was not the first to use the title *tai-kun*, for in the middle of the 17th c. it was applied to one of his predecessors (Iyemitsŭ, the third shogun, 1623–49), in a letter sent by his government to Corea.

TYE, *tī*, CHRISTOPHER: English musician of the 16th c.; b. 1500, at Westminster. He was educated in the King's Chapel, and held the office of musical instructor to Edward VI. when Prince of Wales. He received the degree musical doctor from the Univ. of Cambridge 1545 and from Oxford 1548. Under Elizabeth, he was organist to the Chapel Royal, and produced various services and anthems, some of which are yet in repute among musicians.

TYING, v. *tī'ĭng:* imp. of the verb TIE, which see: binding; fastening: N. in *mining,* the process of washing ores.

TYKE, n. *tīk:* see TIKE.

TYLDESLEY, *tĭl-dĕs'lĭ,* WITH SHAKERLEY, *shāk'ĕr-lĭ:* town of Lancaster co., England; 11 m. w.n.w. of Manchester, 199 m. n.w. of London; on the London and Northwestern railway. It is a modern town, having had its rise and growth within the 19th c. Its chief industries are connected with its cotton-mills and the extensive coal mines near it. It contains the handsome church of St. George, built 1827 in the Early Pointed style.—Pop. (1881) 9,954; (1891) 12,891; (1901) 15,000.

TYLER, n. *tīl'ĕr:* see under TILE.

TYLER, *tī'lĕr:* city, cap. of Smith co., Tex.; on the International and Great Northern, the St. Louis Arkansas and Texas, and the Gulf Short Line railroads; 19 m. n.w. of Troupe, 250 m. n. of Galveston. It is in an agricultural region; is the seat of the U. S. dist. and circuit courts, and the state supreme court for the e. dist. of Tex.; and contains co. court-house, public library, 6 churches, Charnwood Institute, the headquarters of the Gulf Short Line railroad, 2 national banks (cap. $200,000), 1 private bank, and 2 daily and 2 weekly newspapers.—Pop. (1880) 2,423; (1890) 6,908; (1900) 8,069.

TY'LER, BENNET, D.D.: Congregational minister: 1783, July 10—1858, May 14; b. Middlebury, Conn. He graduated at Yale College 1804; studied theol.; was pastor of the Congl. church in South Britain, Conn., 1808–22; pres. of Dartmouth College 1822–28; pastor of the Second Congl. Church in Portland, Me., 1828–33; and pres. and prof. of Christian theol. in the new theol. seminary in East Windsor, Conn. (now at Hartford), from 1833 till his death. He was a strongly logical reasoner and an earnest adherent to Calvinistic doctrine; and was one of the leaders in opposition to the 'new divinity' taught in the Yale Divinity School under Dr. Taylor; was author of several historical, doctrinal, and controversial works; and received his degree from Middlebury College 1823.

TY'LER, JOHN, tenth president of the United States. 1790, Mar. 29—1862, Jan. 18; b. Charles City co., Va.; son of an officer of the army in the revolution, and a judge of the federal court of admiralty. He entered William and Mary College at the age of 12, graduated at 17, was admitted to the bar at 19, and almost immediately entered on a large practice. At the age of 21 he was elected to the state legislature, supporting the policy of Jefferson, Madison, and the democratic party. He was elected five times almost unanimously; and entered congress 1816. During his long congressional career, he sustained all the measures of the states'-rights party. He was elected gov. of Va. 1825, and U. S. senator 1827. He supported Gen. Jackson (q.v.) and the democratic policy; but sided with Calhoun on the question of Nullification (q.v.). At a later period, however, 1833–4, he supported Clay's resolu-

tions of censure on Gen. Jackson for removing the govt. deposits from the U. S. Bank. From this period he became an active adherent of Henry Clay, the candidate of the whig or republican party; and was elected vice-pres. of the United States 1840, with Gen. William H. Harrison as pres. Pres. Harrison died 1841, Apr. 4, a month after his inauguration; T. thus became pres. He began his administration by removing democrats from office, and appointing whigs, and pronouncing in favor of whig measures; but soon afterward vetoed a bill for a U. S. bank, passed by congress, as he believed that congress had no power to create such a corporation within the limits of a state without the consent of that state. Several members of his cabinet resigned; and, after some changes, John C. Calhoun, the great southern democratic statesman, became sec. of state. T.'s administration was on extreme democratic lines, opposed to the party which had elected him. The most important act of his administration was the annexation of Texas, 1845, Mar. 1. At the close of his term of office, he retired to private life until 1861, when he was pres. of a peace convention at Washington. Failing in his efforts at a compromise, he gave his adhesion to the Confederate cause, and was a member of the Confederate congress until his death, at Richmond.

T. married Letitia (1790, Nov 12—1842, Sep. 9), daughter of Robert Christian, a planter of Va. She removed to Washington with her husband 1842, but died shortly afterward—the duties of mistress of the White House devolving on her daughter-in-law, Mrs. Robert Tyler.

TY'LER, Moses Coit, LL.D., L.H.D.: educator: b. Griswold, Conn., 1835, Aug. 2. He graduated at Yale College 1857, and at the Andover Theol. Seminary 1860; was pastor of the First Congl. Church in Poughkeepsie, N. Y., 1860-62; engaged in lecturing, study, and literary work in England 1863-67; was prof. of the Eng. language and literature in the Univ. of Mich. 1867-81; and since 1881 has been prof. of American history in Cornell Univ. He was ordained deacon in the Prot. Episc. Church 1881, and priest 1883, and received the degree LL.D. from Wooster Univ. 1875, and L.H.D. from Columbia College 1888.

TY'LER, Robert Ogden: milit. officer: 1831, Dec. 22—1874, Dec. 1; b. Greene co., N. Y. He graduated at the U. S. Milit. Acad. 1853; entered the army as brevet. 2d lieut. of artil.; served principally on the w. frontier till 1860, when he was transferred to New York. In the civil war he took part in the expedition for the relief of Fort Sumter; in reopening communication between Washington and Baltimore; in the defense of Washington; in the Va. peninsular campaign; and in the principal operations of the Army of the Potomac. He was promoted brig.gen. of vols. 1862; brevetted brig.gen. and maj.gen. U. S. A. at the close of the war; and was afterward transferred to the quartermaster's dept., with rank of lieut.colonel.

TY'LER, ROYALL: jurist: 1757, July 18—1826, Aug. 16; b. Boston. He graduated at Harvard College 1776; studied law with John Adams; served a short time in the revolutionary war and in the Shays rebellion; settled in Guilford, Vt., to practice law 1790; and was judge of the state supreme court 1794–1800, and chief justice 1800–06. T. was one of the earliest American dramatists and humorists, and a frequent contributor of prose and verse to the periodicals of his day.

TY'LER, WILLIAM SEYMOUR, D.D., LL.D.: classical teacher and author: b. Hartford, N. Y., 1810, Sep. 2. Since 1826, except two years at Andover Theol. Seminary, he has been connected with Amherst Coll. as student (graduating 1830), tutor, and prof., his chair being that of Greek lang. and lit., and for the first few years including Latin also. He is widely known as a learned writer for reviews and as a forcible preacher. Beloved by students, he has repeatedly been acting pres. during his 55 years' professorship. Besides his annotated text book editions of Tacitus, Plato, Homer, and Demosthenes, he has published a prize essay, *Prayer for Colleges* (1854); *Memoir of Dr. Henry Lobdell* (1859); *Theology of the Greek Poets* (1867); *Plutarch on the Delay of the Deity* (1867); and *History of Amherst College* (1873).

TY LER INSURREC'TION: see WAT TYLER INSURRECTION.

TYLOPHORA, *tī-lŏf'o-ra:* genus of plants, of nat. order *Asclepiadaceæ*, natives of the E. Indies, New Holland, etc.; with wheel-shaped corolla and five-leaved fleshy coronet. *T. asthmatica*, native of the coast of Coromandel, has high reputation as a medicinal plant: its root has properties like those of ipecacuanha, and has been found of great use in dysentery.

TYLOR, *tī'lẽr*, EDWARD BURNETT, D.C.L., LL.D.: antiquarian and ethnologist: b. London, 1832, Oct. 2. He was educated at the Friends' School, Tottenham. His researches have been concerned with the study of human races, their history, languages, and customs. He became keeper of the museum of Oxford Univ. 1883; later, reader in anthropology in that univ.; Gifford lecturer in Aberdeen Univ. 1888. He is author of *Anahuac, or Mexico*, etc.; *Researches into the Hist. of Mankind; Primitive Culture; Anthropology: an Introduction to the Study of Man and Civilization.*

TYMBAL, n. *tĭm'băl:* see TIMBAL.

TYMPAN, n. *tĭm'păn* [F. *tympan*—from L. *tympănum;* Gr. *tumpănon*, a drum, a timbrel—from *tuptō*, I strike: It. *timpano*]: in a platen *printing-press*, the parchment frame on which the sheet of paper is laid before being turned over on the form of type to be printed. TYMPANUM, n. *tĭm'-pă-nŭm*, a drum-shaped wheel with spirally curved partitions, used for raising water for the purposes of irrigation: in *anat.*, the outer membranous wall of the middle cavity of the ear, familiarly called the drum of the Ear (q.v.); the cavity itself: in *arch.*, the naked face of a pediment, usually

a triangular space or table in the corners or sides of an arch, often enriched with figures; the die of a pedestal; the panel of a door. in *bot.*, a membrane which stretches across the mouth of the spore-case of some urn-mosses. TYMPANIC, a. *tĭm-păn'ĭk*, or TYM'PANAL, a. *-pă-năl*, belonging to the tympanum or drum of the ear. TYMPANIZE, v. *tĭm'pă-nīz*, to stretch, as the skin over a drum-head. TYM'PANIZING, imp. TYM PANIZED, pp. *-nīzd*. TYM'PANITES, n. *-pă-nī'tēz*, or TYM'PANY, n. *-pă-nĭ*, in *med.*, a flatulent distention of the abdomen. TYM'PANIT'IC, a. *-nĭt'ĭk*, relating to, of the nature of, or affected with tympanites.

TYNDALE, *tĭn'dal* (or TINDALE), WILLIAM: eminent English reformer and martyr, translator of the New Test. and the Pentateuch: about 1484–1536; b. Gloucestershire. He was educated first at Oxford, afterward at Cambridge, and was from his youth, as Foxe says, 'singularly addicted to the study of the Scriptures.' After leaving Cambridge, he became tutor and chaplain in the house of Sir John Walsh, a knight of Gloucestershire, where his religious debates with the clerical dignitaries of the neighborhood soon aroused their wrath. He went to London about the middle of 1523, bent on fulfilling his long-cherished desire of translating the New Test. into English. Finding publication impossible in England, he retired to Germany 1524, visited Luther, and fled from place to place under persecution, completing his transl. and publication of the New Test. at Worms 1526. This work was conveyed into England, and, though denounced by government, was yet so eagerly received by the people that several reprints were produced by the Dutch printers in the next few years. T. continued on the continent, writing tracts in advocacy of the Reformed doctrines, in 1530 he published his transl. of the Pentateuch, and 1531 one of the prophet Jonah. From 1530 he appears to have dwelt chiefly in Antwerp, where, 1534 and 5, he pub. two revised editions of his New Test. He was continuously the subject of plots, and 1535 he was treacherously arrested, and after a confinement of 16 months in the castle of Vilvorde, near Brussels, was publicly strangled as a heretic, and his body afterward burned at the stake at Antwerp.—T. was a man of great learning and talent; and his writings, in addition to his translations, show how well adapted he was for the great work of his life, so fearlessly carried out. Our modern (King James's) version of the New Test. is usually regarded as substantially T.'s transl. with modernized spelling: see BIBLE, THE.—For bibliography, see Introduction to Mombert's critical reprint of T.'s Pentateuch (New York 1884): for biography, see *William Tyndale*, by Rev. R. Demaus, M.A. (1871).

TYNDALL, *tĭn'dal*, JOHN, LL.D.: physicist: b. 1820, Aug. 21, at Leighlin Bridge, county Carlow, Ireland. He had few educational advantages. On returning from the continent, where he received part of his education, he found employment in one of the subordinate grades of the ordnance survey. He was afterward appointed teacher of

nat. philos. at Queenwood College, Hampshire, and there began those original investigations which have distinguished him among explorers of science. 1853, Jan., he communicated his first paper to the Royal Soc., *On Molecular Influences—Transmission of Heat through Organic Structures.* It shows much of that skill in experimenting and fertility of resource which characterize his subsequent researches, and illustrates important questions in natural philosophy. Year by year, T. has extended scientific knowledge. His field of research is wide and varied, as exemplified by the subjects of his papers in *Philosophical Transactions: On the Vibrations and Tones produced by the Contact of Bodies having Different Temperatures* (1854); *On the Physical Phenomena of Glaciers* (1857); *On Some Physical Properties of Ice* (1858–9); *On Transmission of Heat through Gaseous Bodies* (1859); series on *Radiation,* six papers (1861–65); *On Calorescence* (1865); *On the Invisible Radiation of the Electric Light* (1865). In 1867 he lectured on *Sounding and Sensitive Flames.* In 1855 and 61 T. was appointed to deliver the Bakerian lecture to the Royal Soc.; the subjects were: *On the Nature of the Force by which Bodies are repelled from the Poles of a Magnet;* and *On the Absorption and Radiation of Heat by Gases and Vapors, and on the Physical Connection of Radiation, Absorption, and Conduction,* the latter being one of the series on *Radiation* above mentioned. The publication of this series marks an epoch in scientific research, for the facts and conclusions therein set forth demonstrate the relation of aqueous vapor to radiant heat, and elucidate meteorological phenomena connected with some of the profoundest and most interesting questions of cosmical science.

In 1864 the Council of the Royal Soc. awarded to T. their Rumford medal, in recognition of his scientific researches, particularly as bearing on Light and Heat. As lecturer on scientific subjects he had high reputation: his lectures at the Royal Institution and the School of Mines are marked by fulness of knowledge and clearness of illustration: he experimented with and wrote on germs and on the acoustic transparency or cloudiness of the atmosphere, and on many other subjects. In 1852 T. was elected a fellow of the Royal Soc. In 1853 he was appointed prof. of nat. philos. in the Royal Institution, where, as successor to Davy and Faraday, he sustained the reputation of the place for original research. His lectures at the School of Mines were attended by crowds of working-men. His lines of study and thought were essentially in the natural sciences, and some of his occasional excursions into the regions of metaphysics or theology have not shown his powers at their best. He was LL.D. of Cambridge, and a member of a number of scientific societies on the continent. He was chosen pres. of the Brit. Assoc. 1874. Besides his papers for the Royal Soc., T. wrote articles in the *Philosophical Magazine* and *The Fortnightly Review.* Among his many separate works are: *The Glaciers of the Alps, being a Narrative of Excursions and Events* (1860); *Mountaineering in 1861* (1862); *Heat considered as a Mode of Motion* (2d

ed. 1865); *Radiation*, the Rede lecture at Cambridge 1865; *Lectures on Sound* (1867); memoir of Prof. Faraday (1868); *Fragments of Science*, and *Hours of Exercise in the Alps* (1871); *Six Lectures on Light* (1873); *Address delivered before the British Association in 1874, with Additions* (1874); *Essays on the Floating Matter of the Air* (1881). He d. 1893, Dec. 4.

TYNDARIDÆ, n. plu. *tĭn-dăr'ĭ dē* [L., the sons of Tyndarus: Gr. *Tundareos, Tundaros*]: in *class. myth.*, Castor and Pollux (q.v.), sons of Tyndarus, King of Lacedæmon.

TYNE, *tīn:* river in n. England, formed by confluence of two head-waters—the North T. and the South T. The N. T. rises on the Scottish border, 11 m. s.e. of Hawick, flows s. across Keelder Moor, and s.e. to Hexham, after traversing a district of picturesque villages and gentlemen's seats. Its chief affluent is the Reed, which rises on Carter Fell and flows s e. past Otterburn to Bellingham, where it joins the larger stream. Near Hexham the N. T. is joined by the S. T., which rises on the slopes of Cross Fell, 11 m n. of Appleby, in Westmoreland, flows n. to Haltwhistle, thence e. to Hexham, through a district abounding in old castles and peel-houses. From the junction of the two head-waters, the T. flows e. through s. Northumberland, which presents charming scenery and is studded with castles and country seats. At Blaydon—about 8 m. above Newcastle—navigation begins, and from this point, passing Newcastle (q.v.), Gateshead (q.v.), N. Shields (q.v.), and S. Shields (q.v.), its banks are lined with foundries, furnaces, docks, wharves, and quays. Total length 80 m. The T. owes its importance to the valuable mineral district through which it flows.—See Guthrie's *River Tyne: Its History and Resources* (1880).

TYNEMOUTH, *tīn'mŭth* or *tĭn-:* small village and parish of Northumberland, England; on the n. bank of the river Tyne, and near its mouth—hence the name. It is 8 m. e. of Newcastle by railway, and its light-house is in lat. 55° 1′ n., long. 1° 25′ w. Though itself only a village, it gives name to a township, most of which, however, is comprised in the town of N. Shields (see SHIELDS, NORTH). It also gives name to a parliamentary and municipal borough, including, besides the village of T., the large town of N. Shields and the three villages Chirton, Preston, and Cullercoats. The village of T. is much frequented as a watering-place by the inhabitants of Newcastle. Its sands, about a mile in length, form an excellent bathing-ground. There are many attractive buildings and institutions, as the castle and fortifications, the fine ruins of a priory and Lady chapel, the Master Mariners' Asylum, etc.—Pop. of township 21,000; of borough (1881) 43,863; (1891) 46,267.

TYNG, *ting*, STEPHEN HIGGINSON, D.D.: Prot. Episc. clergyman: 1800, Mar. 1—1885, Sep. 4; b. Newburyport, Mass. He graduated at Harvard College 1817; spent two years in mercantile business; studied theol. in Bristol, R. I.; and was ordained in the Prot. Episc. Church 1821. In 1821–23 he was rector in Georgetown, D. C.; 1823–29 in Prince George co., Md.; 1829–33 of St. Paul's, and 1833–45 of the Church of the Epiphany, both in Philadelphia; and 1845–78 of St. George's in New York. He was retired from his last charge as rector emeritus, with a pension. He received his degree from Jefferson College, 1832 and Harvard 1851. T. was noted for his fervid and pungent pulpit eloquence, and as a vigorous leader of the 'low church' clergy in the denomination. At various times he was editor of the *Episcopal Recorder*, the *Theological Repository*, and the *Protestant Churchman;* and was a founder of the Evangelical Knowledge Soc., the American Church Missionary Soc., and the Evangelical Education Soc. He was popular and effective in addresses on temperance and patriotic subjects; and published, among many theological and biographical works, *Lectures on the Law and the Gospel* (Philadelphia 1832); *Forty Years' Experience in Sunday-schools* (New York 1860); *The Prayer-book Illustrated by Scripture* (8 vols 1863–67); and *The Office and Duty of a Christian Pastor* (1874).—His son, STEPHEN HIGGINSON T., Jr., D.D. (b. Philadelphia, 1839), was rector of Holy Trinity Church (Prot. Episc.), New York, 1865–81; but resigned and became manager in Paris of the European interests of an American life insurance company.

TYPE, n. *tīp* [F. *type*, type—from L. *typus;* Gr. *tupos*, a figure an image on a wall—from *tuptein*, to strike: It. *tipo*]: a mark of something; an emblem, sign, or symbol; a general form which gives character of similarity to others; a figure of something to come; the design on a medal; the shape or form of a letter of the alphabet in metal or wood, or the prism-shaped piece of metal or wood on the face of which such a letter has been formed (see below); a peculiarity in the form of a disease; the primitive idea or pattern of a work of art, having its existence in nature; the perfect representation or idea of anything: in *biol.* and *nat. hist.*, the characteristic representative of a class, genus, or species, in which its most ideal peculiarities are realized, or such a group, class, genus, or species; compare *Archetype*, the simple essential plan common to all divisions and members of a sub-kingdom or class: V. to typify. TYPIC, a. *tĭp'ĭk*, or TYP'ICAL, a. *-ĭ-kăl*, emblematic; figurative; indicative rather than positive; in *bot.*, etc., applied to a specimen which has eminently the characteristics of the species, or to a species having the characteristics of an order; representing something future by a form, model, or resemblance. TYP'ICALLY, ad. *-lĭ*. TYP'ICALNESS, n. *-nĕs*, the state of being typical. TYP'IFY, v. *-fī* [L. *facĭō*, I make]: to represent by an image or resemblance; to foreshadow; to prefigure. TYP'IFYING, imp. TYP'IFIED, pp. *-fīd*. TYP'IFICA'TION, n. *-kā'shŭn*, act of typifying. TYPE-FOUNDER, a manufacturer of types for printing. TYPE-FOUNDRY, a

place where types are manufactured. TYPE-METAL, an alloy of lead, antimony, and tin, used in making types. TYPIC FEVER, a fever that is regular as in its attacks, or follows a regular type, as distinguished from *erratic* fevers, which are irregular in their attacks, or appear at undeterminate intervals.

TYPE, in Theology: image or representation of some object which is called the Antitype (q.v.) In theological use, T. denotes chiefly, though not exclusively, those prophetic prefigurings of the persons and things of the New Dispensation which are found in the ritual and the history of the Old Testament. See HERMENEUTICS: EXEGESIS: for the different senses of which the literal text of Scripture is considered susceptible. Of one of these, the 'mystical,' a further subdivision is the 'typical' sense. The word 'type' itself is used by the writers of the New Test. (Acts vii. 43; Rom. v. 14; Phil. iii. 17); also by the Jewish historians, e.g., Philo, *Opp.*, t. I., 108; and while Paul and other sacred writers speak of the ancient types of things to come, Peter completes the parallelism by describing baptism as the antitype of the ark of Noah, I Pet. iii. 21. Of the types of the Old Test., many are directly pointed out as such in their very institution; many also are distinctly applied in the New Test. There is a large class, however, which more properly fall under the mystical sense of Scripture, and which are called indirect, i.e., 'adaptive' or 'applied,' types: in application and interpretation of these, many of the Fathers, and especially Augustine and Gregory the Great, are amazingly elaborate and ingenious.

TYPE: a right-angled prism-shaped stamp or die of wood or metal having on one end (the face) a letter or character in high relief, used in Printing (q.v.). The name is used also for the aggregate of such lettered dies, as well as for the particular style or variety of letter impressed by them. The earliest types (in this last sense) were in the style known as Gothic or Black Letter (q v.); this was superseded, except in Germany, by Roman and Italic. The top of a type is its 'face;' the lower end on which it stands is grooved, thus forming 'feet;' the 'shoulder' is the part on the top which projects beyond the letter; from the shoulder to the foot is the 'shank' or 'body;' and the front or 'belly' of the shank has a nick or nicks across it to serve as a guide to the type-setter in placing the type in his 'stick' (see TYPE-SETTING).

The sizes of type used at the present day are very numerous, ranging from *brilliant*—the minutest kind, used in printing vest-pocket Bibles—to those used in placards and posters. In book-work about 16 sizes are in use. *Brilliant*, the smallest regular size, has about 239 lines to the lineal foot; *gem*, next in order, 222; *diamond*, 207; *pearl*, 178; *agate* (or *ruby*), 166; *nonpareil*, 138; *minion*, 122; *brevier* (in which this is printed), 111; *bourgeois*, 102½; *long primer*, 89; *small pica*, 83; *pica*, 71½; *English*, 64; *great primer*, 51¼; *double pica*, 41½; and so on. All sizes larger than *canon* (about 17⅘ lines to the foot) are named by the

regular multiples of pica, English, etc., according to the class respectively—e.g., *two-line pica, two-line English, four, six, eight,* or *ten-line pica,* etc. Some of these names were given from the first maker; others from the books first printed with the particular letter. Thus, *Cicero* is the name of a type in France and Germany, with which Cicero's letters were first printed (Rome 1467); *pica* is from the service of the mass, termed *Pica* or *Pic; primer,* from *Primarius,* the book of Prayers to the Virgin; *brevier,* from *Breviary; canon,* from the *canons* of the church; etc.

In the United States the common unit of size is the 'point' (about $\frac{1}{72}$ of an inch), adopted 1883 by the United States Type-founders' Assoc. The point system, however, originated in France 1737, and is now in general use there and in Germany. The point in use in the United States is slightly smaller than the French point, 12 of the latter being nearly equal to 13 points of the former. In this system brevier is called 8-point, minion 7-point, nonpareil 6-point, pica 12-point, etc.

All kinds of types are sold by weight by the founders, the price varying in amount according to the size of the letter—the smallest size being the most expensive. In the *diamond* size ($4\frac{1}{2}$ points) 2,800 go to a single lb. of the letter *i*, and of the thinnest *space* about 5,000.

A complete assortment of types is called a *Font,* which may be regulated to any extent. A font of 1,000 lbs. would contain about 514 lbs. of Roman lower-case (i.e., small letters), 86 lbs. of capitals, 20 lbs. of small capitals, 40 lbs. of figures, 28 lbs. of points, 85 lbs. of spaces, 122 lbs. of Quadrats (q.v.), 5 lbs. of fractions, 73 lbs. of italic lower-case, 23 lbs. of italic capitals, and 4 lbs. of sundries. Every type-founder has a scale showing the proportional quantity of each letter required for a font; and a peculiar scale is required for every language. For the Eng. language, the following is a type-founder's scale for the small letters of a font of types of a particular size and weight:

a	8,500	h	6,400	o	8,000	v	1,200
b	1,600	i	8,000	p	1,700	w	2,000
c	3,000	j	400	q	500	x	400
d	4,400	k	800	r	6,200	y	2,000
e	12,000	l	4,000	s	8,000	z	200
f	2,500	m	3,000	t	9,000		
g	1,700	n	8,000	u	3,400		

It appears from this scale that the letter *e* is used much more frequently than any other character. The standard height of type in Great Britain is ·9166 inch; in the United States it varies from that to ·9186 inch. See TYPE-FOUNDING: TYPE-METAL; TYPE-SETTING.

TYPE-FOUNDING: the casting of metal type for use in printing. In the early days of printing, the type used by printers were cast by themselves; but as the art developed, type-founding as a distinct business became necessary.

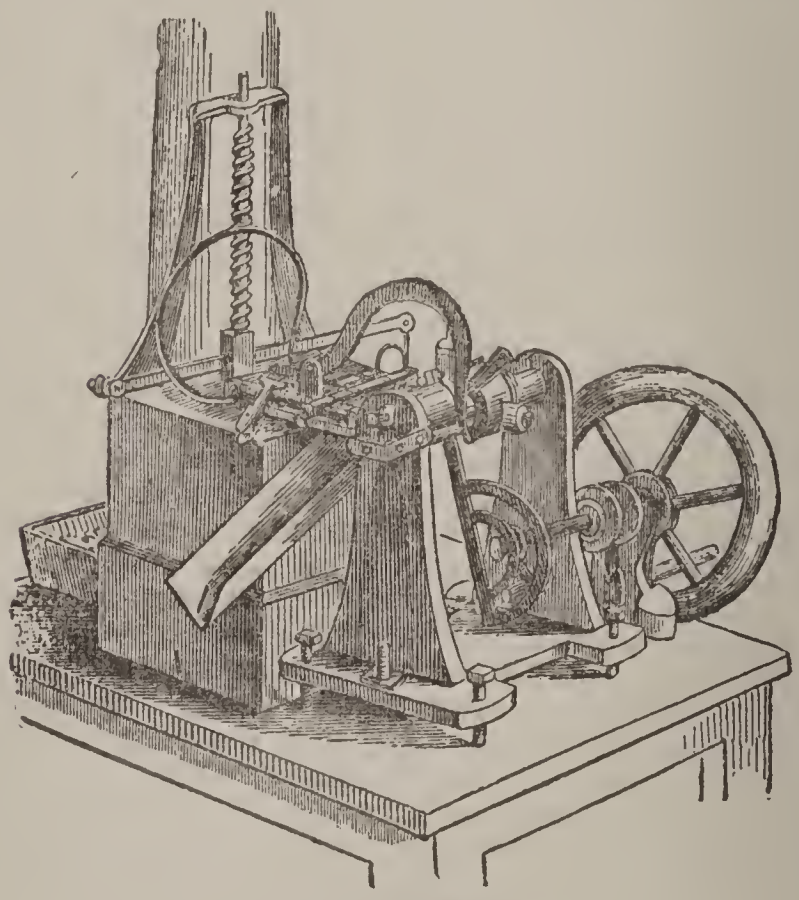
Type-founding originated in Germany with printing; as early as 1452, P. Schöffer (see GUTENBERG) had substituted types of cast-metal for the original wooden types. The earliest and best punch-cutters were in Nürnberg, which for a time supplied the type-founders throughout Germany with punches. Bodoni (1740–1813) in Italy, the Didots (q.v.) in France, and Breitkopf (1719–94) in Leipzig, are the most distinguished names in the subsequent history of type-making on the continent. The art made little progress in Great Britain from the time of Caxton, and the types used were mostly imported from Holland, until about 1720, when William Caslon, originally an engraver of ornamental devices, turned his attention to letter-cutting, and soon established such a reputation as not only put a stop to importation of foreign types, but caused his own to be frequently sent to continental countries: the foundry established by him in London is still in existence. Baskerville (q.v.) is the next greatest name in the history of the art in England. The types produced by Alexander Wilson, of Glasgow, became the foundation of the fame of the Foulis (q.v.) as printers. The type-foundry of Miller & Richard in Edinburgh has had well-merited reputation for more than half a century, which it still maintains. In the United States many improvements have been introduced.

At the beginning of the 16th c. the apparatus for type-founding was much the same as till near the middle of the 19th c. The first step in the process is the cutting of a punch or die resembling the required letter. The punch is of hardened steel, with the figure of the letter cut, the reverse way, on its point. This die is struck into a piece of copper about an inch and a quarter long, one-eighth of an inch deep and of width proportionate to the size of the type to be cast. This copper, being so impressed with the representation of the letter, requires to be adjusted to the mold in which the type are to be cast, so that the 'face' or impression of the punch (in the copper) may be brought into such relation with the metal which forms the 'body' or stalk of the type that when the types are 'set up' they may stand at the proper distance from each other, and be in 'line' or range, and also square to the page: this work is termed 'justifying,' and the copper when so justified and squared is termed a 'matrix.' The matrix is then fixed into a small instrument or frame, called the mold, composed of two parts. The external surface is of wood, the internal of steel. At the top is a shelving orifice, into which the metal is poured. The space within is of the size of the required body of the letter, and is made true. The melted metal, being poured into this space, sinks down to the bottom into the matrix, and, instantly cooling, the mold is opened, and the type drops out. This process

of casting types is executed with great celerity. Every separate letter in the alphabet, every figure, point, or mark, must have its own punch and matrix. In casting types, the founder stands at a table, and has beside him a small furnace and pot with heated metal (see TYPE-METAL), which he lifts with a small ladle.

Various attempts were made during the early part of the 19th c. to cast type by machinery. The first successful apparatus was the invention of Elihu White, of New York. This has been modified and repeatedly improved by David Bruce, a Scotsman resident in the United States. The type-casting machine was introduced into Great Britain, and patented by Miller & Richard, of Edinburgh, 1848. This machine requires a man to drive it, but produces more than double the quantity produced by hand in any given time, while the finish and regularity of the type are much more perfect. Another machine was constructed and patented some years after by the same firm, with the view to apply steam for driving, which was successfully completed 1860, and is now the approved system of casting.

The type-casting machine consists, first, of a small melting-pot, which contains the molten metal and is placed over a small furnace having an outer case of cast-iron.



Type-casting Machine.

In the interior of the pot is arranged a forcing-pump and valve for admitting the metal under the piston, by the action of which the molten metal is forced through a narrow channel leading from the bottom of the chamber in which the piston works to the outside of the pot, where

there is a nipple, with a small hole through it. Against this nipple the mold in which the type is formed is pressed at the moment at which the piston descends, and so receives the molten metal that forms the type.

The second part of the machine is that which carries the mold, and to which it is firmly bolted. The mold is similar to the old hand-mold, but modified to suit the machine; it is much stronger; the 'jets' are shorter, and the orifice by which the metal enters is smaller, so that it may be made to coincide exactly with the small hole in the nipple in front of the pot. The mold—as the old hand-mold—is made in halves; one being firmly bolted to an arm which, by cams and levers is made to oscillate, and carry the mold to and from the nipple in front of and above the pot: the other is bolted to another arm, which, by a peculiarly formed hinge, is attached to the first arm, so that the two halves of the mold may be made to open and shut on each other, like the lid of a snuff-box; and so both sides of the mold oscillate together to and from the nipple in the pot from which they receive the molten metal. The operation of the machine is as follows: the piston being raised in the chamber of the pump, and the chamber being supplied with metal through the valve, the mold is brought against the nipple; the valve closes, to prevent the metal being forced back into the pot; the piston descends, and forces the metal through the narrow channel into the mold; the mold then recedes from the nipple, and in receding the two halves separate from each other, and eject th type; the mold again approaches the nipple, and in approaching the two halves close together, and are ready for another operation. A blast of cold air is directed upon each mold, to keep it cool.

When the type drops from the mold, it is in a rough state; and as soon as a heap has accumulated on the caster's table, the types are removed by a boy, who breaks off a superfluous tag of metal, or 'jet,' hanging at the end of each. From the breaking-off boy the types are removed to another place, where a boy rubs or smooths their sides on a stone. When well smoothed, they are removed to a table, and set up in long lines upon a 'stick' (see TYPE-SETTING): they are then dressed or finished, and after being examined by a magnifying glass are ready for use. Whatever be the size of the types, they all are made of uniform height (see TYPE), and must be perfectly true in their angles, otherwise it would be impossible to lock them together: a single irregular type would derange a whole page. All the types of one class of any founder are always uniform in size and height; and to preserve their individuality, all the letters, points, etc., belonging to one class are distinguished by one or more notches or nicks on the body of the type, which range evenly when the types are set. These nicks are useful also in guiding the hand of the compositor. Types are all equally grooved in the bottom, to make them stand steadily.

TYPE-METAL: alloy of lead, regulus of Antimony (q.v.), and tin, used for making the types (see TYPE) used in printing and for stereotypes (see STEREOTYPING: TYPE-FOUNDING). Originally the proportion of tin was small, but 1856 a new compound was formed by adding a large proportion of tin. This increased the cost considerably, but doubled the durability of the type. The antimony gives hardness and sharpness of edge to the composition, while the tin gives toughness and tenacity, and removes the brittleness which antimony causes when used without tin. The proportion generally used in making type-metal for small type consists of about 100 lbs. of lead, 40 lbs. of antimony, and 20 lbs. of tin. For larger sizes the proportions of antimony and tin are reduced. Copper and iron are sometimes added in very small quantities to impart resistance.

TYPES, CHEMICAL: compounds of two or at most of three elements, supposed to persist throughout long series of complex compounds. The type-theory was fully developed by the German chemist Gerhardt, whose predecessors in the same line of theorizing and systematizing were Dumas, T. Sterry Hunt, and Laurent: it is now largely superseded by the use of formulæ representing more accurately the internal constitution of chemical compounds. On the theory of types, water, H_2O, represented thus, $\left.\begin{matrix}H\\H\end{matrix}\right\}O$, would be the type of all alcohols, one atom of the H giving place to an alcohol radical, e.g., to C_2H_5, to produce ethyl alcohol, C_2H_6O, or $\left.\begin{matrix}C_2H_5\\H\end{matrix}\right\}O$. The *ammonia type*, NH_3, represented thus, $\left.\begin{matrix}H\\H\\H\end{matrix}\right\}N$, includes the nitrides and phosphides, the ammonia compounds, and the amides: thus, ethylamine, C_2H_7N, = the above ammonia type, with one of its hydrogen atoms replaced by C_2H_5. The *hydrochloric acid type*, $\begin{matrix}H\\Cl\end{matrix}$, includes the chlorides, fluorides, iodides, bromides, cyanides, etc.: thus benzoyl chloride, C_7H_5OCl, $= \begin{matrix}C_7H_5O\\Cl\end{matrix}$.

TYPE-SETTING: the art or act of combining type in proper order for printing; called also 'composing'—hence a 'type-setter' is called a 'compositor,' and the setting of the type 'composition.' In type-setting a 'composition' is performed by picking up the types one by one, each out of its own box in the Cases (q.v.), which rest on a 'composing-frame,' and placing them side by side, face up, and the nicks in front, in a small hand-tray, called a 'composing-stick' (of wood, brass, or iron), with a movable slide, which, by means of a screw, may be regulated to any width of line. In either case, the composing-stick is made perfectly true and square. When the compositor arrives at the end of his line, he has a task in which great carefulness is required. The first letter and the last must be at the extremities of the line: there must be no large spaces left in some instances, and crowding in others. Each type is of a constant thickness, as far as regards that particular size of letter; though all the letters are not of the same thickness. The adjustments, therefore, to complete the line with a word, or with a syllable, must be made by varying the extent of the spaces between the words. A good compositor's work is distinguished by uniformity of spacing; he will not allow the words to be very close together in some instances, with large gaps between them in others. In setting up poetry, or similar matter, where there is a blank space at one end of the line, spacing is easily accomplished by filling up the blank with larger spaces, or *quadrats*. But whether prose or poetry, the matter of each line must be equally adjusted and *justified*, so as to correspond in compactness with the previously set lines. The process of composing is greatly facilitated by the compositor using a thin slip of brass, called a *setting-rule*, which he places in the composing-stick when he begins, and which, on a line being completed, he pulls out, and places on the front of the line so completed, in order that the types he sets may not come in contact with the types behind them, but glide smoothly into their places.

Fig. 1.

When the compositor has set up as many lines as the composing-stick will conveniently hold, he lifts them out by grasping them with the fingers of each hand, thus taking them up as if they were a solid piece of metal. He then places the mass in an elongated board, termed a *galley*, which has a ledge on one or perhaps both sides. The facility with which some compositors can lift what is called a *handful* of movable type without deranging a single letter is remarkable. This sort of skill can be attained only by practice. When the compositor has set up as many lines as fill a page, he binds them tightly round with cord, and removes them from the galley.

Sometimes, as in the case of newspaper and similar work, the *handfuls* of type are accumulated till they fill the galley, and in that form are prepared for press. After the matter is thus far prepared, it is the duty of the pressman to take an impression or *first proof* from the types, in order

that the first-proof *reader* may compare with 'copy,' or MS.; after which it is handed to the compositor, so that he may correct the errors which are sure to have been made. Proofs are taken usually by a press kept for the purpose. After the galley matter is corrected and recorrected by the compositor, it is divided into pages of the size wanted; and head-lines or figures indicating the number of the page being added, the pages are arranged upon a large firm table, and there securely fixed up or 'locked' in an iron frame or *chase*, by means of slips of wood and wedges, or *quoins*. The annexed cut is a representation of a small *form*, consisting of four pages of type.

This process, called *imposing*, being completed, and the face of the types levelled by a *planer* and mallet, the *form*, as it is called, is proved, and prepared for press. From

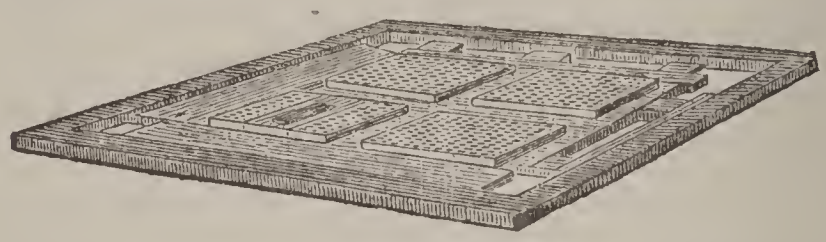


Fig. 2.

this is cast the stereotype, when that is to be used to print from: see STEREOTYPING. The imposing-table is usually of smooth stone, or marble, or cast-iron, on the top, and requires to be a substantial fabric.—See TYPE: TYPE-FOUNDING: LINEOTYPE: TYPE-SETTING AND TYPE-DISTRIBUTING MACHINE.

TYPE-SETTING AND TYPE-DISTRIBUTING MACHINE: mechanical invention to supersede the setting and the distributing of printing-types by hand. The first type-composing machine on the records of the Eng. patent office was that of W. Church, 1822, Mar. This, after 20 years, was followed by a number of others; but none were satisfactory. It is in the spacing out of the words so as to neatly fill up a line, which is called 'justifying,' that the early machines failed, because another operator afterward had to space the machine-setting into lines of equal length. It is comparatively easy to construct a machine which will, by some mechanical arrangement, set up type, in any required order, but with *exactly equal spaces* between the words; and the difficulty of justifying has only recently been surmounted.

In the early composing-machine by Church, 'the types are arranged in files in a case at the top, each file being directly over a slit in a horizontal frame. One of a number of jacks protrudes through each of these slits, each jack being connected with a key in a manner somewhat similar to the jacks and keys of a harpsichord.' This description conveys the leading idea in most of the type-composing machines invented since 1822.—Hattersley's machine, patented 1857, has somewhat analogous movements, but different mechanism and details. A machine on Hattersley's principle, with details much improved by Alex.

Fraser, of Edinburgh, was in use by a large printing-firm there: with it an operator can compose from 'copy' at the rate of from 10,000 to 12,000 types per hour; but this rate could not be maintained continuously, the strain of such rapid setting being too great for the operator.

A type-distributing machine being quite as important as a composer, one was invented by Fraser—recently improved, according to patent 1884, July 24. In general appearance it resembles his composer, but with face-plate inverted. Three of these distributing-machines are required to keep pace with two of his composing-machines.

A type-composing machine invented by a German named Kastenbein was in operation many years in the London *Times* office: it is on the same principle as the foregoing, but its details have been improved from time to time. A composing-machine on a different principle, invented by Mackie, somewhat resembled the Jacquard loom.

Among early machines were two of William Mitchel, Irish inventor—one for setting, another for distributing the type. The types were distributed by notches on their sides, a characteristic notch or notches being used for each letter. This machine was experimented with in New York, and much work was done with it; but, like many other type-setting machines, it was found not economical. —The next development took the form of matrix-producing machines: in these, type-faces were struck against a soft *papier-maché* or equivalent surface so as to give a matrix, the reverse of type, upon which a stereotype plate could be cast.

The approved recent machines may more properly be termed stereotyping-machines, of the Mergenthaler and of the Rogers class. In both of these machines, movable matrices are employed, which are moved into line by the operator, who works the keys of a key-board. Between each word the small end of a wedge-shaped 'space' is inserted. When the end of the line—as near as may be judged, and as determined by the division of syllables and other considerations—is reached, a single movement by the operator presses up all the wedge-shaped spaces until the matrices just fill the line. Melted metal is then run upon the matrices, and a solid block containing one line of type is produced. As regards speed, an ordinary compositor can set by hand 1,000 to 1,200 ems per hour. One-third additional of his time is required for distribution. For the new machines 5,000 to 6,000 ems per hour are claimed: moreover, no time is expended in distribution, as the machines effect this operation in their regular operation: see LINOTYPE. There are in use at the present time (1897), in printing and newspaper offices, a number of type-setting machines of different patterns, such as the Thorne, Empire, and Macmillan. These machines only set type and do not justify it or cast it when set.

TYPE-WRI'TER: machine for superseding handwriting by a mechanical process. The first successful T.-W. was an American invention, and was so far perfected soon after 1874 that many thousands were then being made to supply the demand.

The archives of the Brit. patent office show that in 1714 a patent for a writing-machine—the first T.-W. known—was applied for by Henry Mill, London engineer. No drawing of his machine is extant, and its construction is not known. In 1784 a French invention appeared, designed to make embossed or raised characters for the blind.—In 1843 Charles Thurber, then of Worcester, Mass., secured a patent for a T.-W., and two years later a second patent: his machines were never perfected for practical use. In 1855 Foucault invented a writing-machine for the blind: he was followed by English inventors; but none of the machines came into practical use. In 1856 Alfred E. Beach, of New York, one of the proprietors of the *Scientific American*, secured a patent for a T.-W. which embodied the characteristic basket-like disposition of type-bars and type used on the Remington and other standard machines of to-day. The Beach machine was for printing embossed letters for the blind. Contemporaneous with this inventor, Dr. S. W. Francis, of New York, was working on the same line. He arranged his keys in a circle around the instrument, used an inking-ribbon, a travelling paper-frame, and an alarm-bell, rung as the end of the line was approached, thus embodying many features of the instruments of to-day. Thomas Hall, of New York (inventor of the Florence sewing-machine), also was experimenting on a T.-W. about this time. In 1859 he learned of the prior patents and tried to purchase them. 1867, June, he obtained a patent of his own; and one of his machines, printing large and small letters, was shown at the Paris Exposition 1867. The paper was placed on a table, which slid under the bottom of the machine. The spacing for letters varied with their thickness, thus producing work more resembling that of type than does the identically spaced type-writing of recent machines. Hall struggled against much discouragement, and never succeeded in bringing his machine into use. John Pratt, of Center, Ala., secured a U. S. patent 1868 for what he called his pterotype—a complicated machine which did not come into public use.

This brings us to the recent history of the T.-W. Charles Latham Sholes, of Milwaukee, Wis., with Samuel W. Soule and Carlos Glidden, became associated: the first two were trying to construct a numbering-machine: Glidden suggested developing the idea into a T.-W. After months of work, Sholes left the others, and with James Densmore, of Meadville, Penn., as financial backer, pushed the invention to completion, and secured a patent 1868, June. In 1873 it was put on the market as the Sholes and Glidden T.-W. E. Remington and Sons, of Ilion, N. Y., were to make the machines; and in 1874, the year when the first one was really on sale, 400 were sold. These early machines printed only one kind of letter. The intro-

duction of small letters occurred 1877, and many minor improvements have since been introduced. The Remington T.-W., as it is now called, is characterized by the 'shift,' by which the same keys print large or small letters as desired. The radial type-bars, forming when at rest a sort of basket, also are characteristic. The Remington type-writer somewhat resembles a sewing-machine in appearance. On the top is a roller covered with India-rubber; and by its side, and parallel, a small wooden roller. Between these the top edge of a sheet of paper is inserted, and brought into proper position to receive the first line of 'writing.' Immediately under the rubber cylinder, and in line with its axis, is the ink-ribbon; and beneath this there is a circular opening, several inches in diameter, in the case containing the mechanism. At a point in the centre of this opening, every letter is made to appear in succession to do the writing. The types are of iron, and are fixed in the ends of a series of levers about 3 inches in length, each lever having its fulcrum at a point in the circumference of the opening. These type-levers are in fact suspended around a kind of well, their short arms being connected with a series of wires actuated by keys which are worked by both hands similar to the way in which a piano is played. The key for forming the spaces between the words extends the whole length of the key-board, so that it can be readily worked, no matter in what position the hands may be at the close of every word. The depression of each key causes the letter with which it is connected to rise quickly in the well; and, when raised, it strikes the ink-ribbon, thereby transferring the form of the letter to the paper. On removal of the pressure, the type descends by its own gravity. When a single letter is printed, the paper and its cylinder are, by means of a coiled spring, traversed at each touch of the key, from right to left of the machine, the precise distance required to admit of the next letter being impressed. At each touch of the key, too, the ink-ribbon is advanced a corresponding distance. After a line is completed, the paper-cylinder is moved back by a peculiar arrangement to the right of the machine, and the pressure of a lever causes it to make a partial revolution, which forms the space between the two lines of the 'writing.'

The Caligraph, invented and developed by George W. N. Yost, uses no shift, but has a separate key for each character: in other respects it resembles the Remington.

The Hall T.-W., patented 1881, Mar. 3, was an innovation. It is very small, and in it a sheet of rubber type-faces is used, and the letters are brought to the right position by a sort of pantograph motion. A die or punch is then brought down upon the back of the sheet over the letter, by the operator, thus impressing the letter on the paper. His machine introduced the era of small and lower-priced machines.

In 1880, Feb., a patent for a T.-W. was granted James B. Hammond, of New York. The type-faces were carried on the periphery of sectors of circles. These were slipped on a vertical pin and rotated around it. Three such sectors

gave three sets of types, thrown into action by two 'shifts.' Instead of striking the type against the ribbon and paper, a hammer gave the paper a blow from the back against the ribbon and type-face. The force of the blow came from a spring, so that an even force was always secured. This feature is one of the most important characteristics of the Hammond machine. The Remington class projects the type against an inking-ribbon, back of which is the paper—the latter receiving the blow, and being backed by a roller. Another class of machine has no ribbon, but uses an inking pad. The type-face strikes this first, and then strikes the paper directly.

The different classes of machine are now very numerous. The Remington still holds a leading position and is a standard machine.—In 1885 a large company was formed in London to manufacture an unusually simple and cheap T.-W., weighing only 2½ lbs., sufficiently portable to be worked in a railroad car. The roller carrying the paper to be written on is placed on a small carriage which moves forward and backward on rails. At right angles to this roller, and slightly raised above it, is the type-bar—the writing, or printing, being executed by moving an indicator, held between the finger and thumb, to any letter on the index, and pressing it down lightly.

As regards speed, a rate of 50 words a minute is good ordinary work; 70 or 80 words is very fast; 90 or 100, exceedingly fast.

TYPHA, *tī'fa:* genus of plants, of nat. order *Typhaceæ* of some botanists, which, according to others, is a sub-order of *Araceæ*. The *Typhaceæ* all inhabit marshes or ditches. They have nodeless stems, unisexual flowers arranged on a spadix without a spathe, the spadix of the male flowers being at the summit of the stem, above that of the female flowers, the perianth consisting of scales or lax hairs, the anthers on long filaments, the fruit dry, consisting of the seed with adherent pericarp. They are found in very different climates and scattered over the world. Two species of T. are found in Europe, *T. latifolia* and *T. angustifolia*, popularly known as CAT'S-TAIL or REED-MACE. *T. latifolia* is the most common, and naturalized abundantly in the United States, where *T. angustifolia* is less common; it may be distinguished by the channelled shape of the leaf-bases, and an interval between the staminate part and the lower downy pistillate portion of the club. It is sometimes called Bulrush. It grows to the height of five or six ft. The root-stocks are astringent and diuretic, and abound in starch. The young shoots of this and *T. angustifolia*, a smaller plant, are much eaten by the Cossacks of the Don; hence known elsewhere under the name *Cossack Asparagus*. The pollen of T. is inflammable, like that of *Lycopodium*, and is used as a substitute for it. *T. angustifolia* and *T. elephantina* are used in India for making mats and baskets.

TYPH-FEVER, *tīf′fē-vĕr:* continued low fever. The best-marked varieties of this affection are known as typhus and typhoid fevers, which in typical cases are easily distinguished from one another, but frequently so merge into one another that it is difficult to decide whether the disease should be classed as typhus or typhoid; hence the general term T.-F. is convenient in doubtful cases. All the typh-fevers belong nosologically to the miasmatous order of zymotic diseases.

TYPHLITIS, n. *tĭf-lī′tĭs* [Gr. *tuphlŏs,* blind]: inflammation of the cæcum.

TYPHOID, a. *tī′foyd:* see under TYPHUS.

TYPHON, n. *tī′fŏn* [Gr. *Tuphōn;* L. *Typhon*]: the evil deity of Egyptian mythology; in *L.* and *Gr. myth.*, the giant Typhōeus, son of Seb (Kronos) and Nut (Rhea). The latter gave birth to five children on the last five days of the year—first, Osiris and Haroeris, then T., and lastly Isis and Nephthys. The Egyptian name of T. was Set, also Sutí and Sutech, and in the earliest times he was a highly venerated god. He often appears on the monuments in the form of a beast, the crocodile, the hippopotamus, or the ass, and with yellow hair and long blunted ears. From him the kings of the 19th dynasty, Seti (Sethos, Sethosis, changed by Herodotus into Sesostris), derive their name. The city of Ombos was a special seat of his worship. In later times, either about the close of the 21st dynasty or afterward, his worship was abandoned, and his figure and name were obliterated from many of the monuments. The cause of this curious religious revolution is unknown; but, at any rate, T. came to be regarded as a god hostile to the Egyptians, and was gradually developed into a personification of the principle of Evil—in short, the Egyptian Satan, the opponent of holy doctrine, and adversary of Osiris—the god of the waste howling wilderness, of the salt lakes, of drought, and of scorching heat.

The connection between the Egyptian *Set* and the Greek T. seems beyond doubt, but is not easily traceable. According to Homer, T. (called also Typhāon) was a huge giant, chained under the earth in the country of the Arimoi, and lashed by the lightnings of Zeus. Hesiod makes him son of Typhōeus and a hurricane; and, by the snake-goddess Echidna, father of the Chimæra, the many-headed dog Orthus, the hundred-headed dragon that guarded the apples of the Hesperides, the Colchian Dragon, the Sphinx, Cerberus, Scylla, Gorgon, the Lernæan Hydra, the Eagle that consumed the liver of Prometheus, and the Nemean Lion. Typhōeus, again, was the youngest son of Tartarus (Hell) and Gæa (Earth), or, as others say, of Hera (Juno) alone. At a later period, the father and son coalesced into one person. Pindar describes T. as a monster with a hundred dragon-heads, fiery eyes, black tongue, and terrible voice. He sought to wrest the sovereignty of the world from Zeus, but after a fearful struggle he was subdued by a thunderbolt from Olympus, and hurled into Tartarus, or buried under Ætna. The later poets modify the older

myth with fabulous additions of their own. They connect T. with Egypt—an evidence that he had come to be identified with the Egyptian *Set*. According to Ovid and others, all the gods fled before him into Egypt, and, through fear, changed themselves into animals, excepting Zeus and Athene. After an appalling struggle, in which Zeus was once hamstrung and carried off by the daring monster, T. was vanquished, but not before he had hurled all Mount Hæmus against his adversary, in a paroxysm of supernatural rage. It is very possible that the fierce *physical* opposition of T. (especially when the monster came to be identified with *Set*, the Egyptian Satan) may have had (with other causes) a material influence in determining that popular conception of Satan which reigned both in patristic and mediæval times, and of which Milton availed himself in *Paradise Lost*.

TYPHOON, n. *tī-fōn'* [Chin. *ta*, great; *fŭng*, wind: the word has been confused with, and influenced in its spelling by, the L. *typhon;* Gr. *tuphōn*, a whirlwind (see TYPHON)]: name given by navigators to one of those tremendous rotatory storms of wind or hurricanes that visit the coast of Tonquin and China as far n. as Ningpo and the s.e. coasts of Japan. Varenius, in his *Geographia Naturalis*, describes them as 'storms which rage with such intensity and fury that those who have never seen them can form no conception of them; you would say that heaven and earth wished to return to their original chaos.' Typhoons are the cyclones of the e. Asiatic coast. They occur from May to Nov., but are most frequent during July, Aug., and Sep. They resemble the great storms of w. Europe (see STORMS) in their general characteristics, but with the main features more strongly marked. There is a depression of the barometer, over a space more or less circular, accompanying the T., but it is generally more contracted in area, and deeper and more abrupt than in European storms. It is not uncommon for the barometer, at the centre of the depression, to read 28·3 inches, and on rarer occasions to fall even as low as 27 inches; and the changes of pressure are very rapid, frequently ·2 or ·3 inch in an hour. It is this enormous difference of atmospheric pressure between neighboring places, and the consequent rapidity of the fluctuation, which gives the T. its terribly destructive energy—the law regulating the strength of the wind being, that it is proportioned to the difference of pressure between the place from which it comes and the place toward which it blows. The low pressure in the centre is confined to a very limited space; and since all round this space the pressure is greater, it follows that the level of the sea there will be higher. Hence a high wave frequently accompanies a T., advancing inland, carrying with it ruin and dismay, and sometimes bearing ships far over the level fields, where they are left stranded.

Typhoons have their origin in the ocean e. of China, especially about Formosa, Luzon, and the islands immediately south. They thence proceed, in four cases out of five, from e.n.e. toward w.s.w., rarely from e.s.e. to

w.n.w., and scarcely ever from n. to s. or from s. to n.; in other words, their course is generally along the coast of China. The whole body of the T. advances at the rate of 12 m. or more an hour; within the body thus travelling the winds blow often 80 to 100 m. an hour, whirling round the centre of atmospheric depression in a direction contrary to the motion of the hands of a watch, as do all storms in the n. hemisphere. They thus rotate in the direction s., e., n., w.; and travel along the coast, so that the coast feels the n. side of the T., while at a distance from the coast the s. side alone is experienced. The rotation, however (according to the latest authorities), is in circles not returning on themselves, nor opening outward by their centrifugal motion, but tending to blow somewhat inward upon the centre of lowest pressure: see CYCLONE: STORMS: METEOROLOGY: ETC. The s.w. Monsoons (q.v.) prevail in summer over s. Asia, to the eastward of which are the n.e. trade-winds: see WINDS. Here, then, are two great aerial currents flowing contiguously, *but in opposite directions*, each highly charged with moisture, especially the s.w. current, which they have taken up from the oceans that they have traversed; and one of the many theories has been, that typhoons take their origin from these opposing currents, like whirlpools at the meeting of two sea-currents. Their intensity is aggravated by the large quantity of heat disengaged in the condensation of the vapor of the atmosphere into the deluges of rain which fall during the storm—10 and 12 inches of rain frequently falling in one day.—See STORMS.

TYPHUS, n. *tī'fŭs* [Gr. *tuphos*, smoke or stupor—from *tuphein*, to smoke]: in *med.*, a very fatal form of fever, contagious and generally epidemic, characterized by much depression, the appearance of an eruption on the skin, and a tendency to putrefaction. TY'PHOUS, a. *-fŭs*, pert. to or of the nature of typhus. TY'PHOID, a. *-foyd* [Gr. *eidos*, resemblance]: pert. to a low form of fever, characterized by general depression and an eruption of the skin, with morbid changes in the intestinal canal. TY'PHOMA NIA, n. *-fō mā nĭ-ā* [*typhus*, and Gr. *mania*, madness]: the low muttering delirium which accompanies typhoid fever.—*Typhus* and *Typhoid* fevers have much in common; and formerly it was the general belief that no definite distinctions could be drawn between the various forms of continued low fever occurring in temperate climates. In 1840 an Eng. physician pointed out the differences now almost universally recognized between typhus and typhoid fevers; but his views received little attention till 1848–50, when Dr. Jenner (afterward Sir William Jenner), physician to her majesty, published two papers on *The Identity or Non-identity of Typhus and Typhoid Fevers*, and on *Diseases commonly confounded under the term Continued Fevers*. In these memoirs it was clearly shown that typhus and typhoid fevers differ, as Dr. Watson observes, 'notably and constantly in their symptoms and course, in their duration, in their comparative fatality, in the superficial markings which respectively belong to them, and which warrant our classing them amongst the exanthemata, in the internal organic changes with which they are severally attended, and (what is the most important and the most conclusive) in their exciting causes.'—In addition to typhus and typhoid, there is a third well-marked variety of continued fever, known as *Relapsing Fever* (q.v.).

Typhus Fever sometimes begins with premonitory symptoms, due to the depressing action of the poison—which, as will presently be seen, is the cause of the disease—on the nervous system before it affects the circulation. The patient, in these cases, is listless, unwilling to make any bodily or mental exertion, loses appetite, feels wandering pains over the body, is drowsy during the day, and restless at night. Usually, however, the disease begins suddenly, a shivering-fit being the first symptom. Severe headache, especially across the forehead, is another common early symptom. The muscular power rapidly becomes enfeebled, and the patient very soon feels compelled to take to his bed. As in typical cases of the disease there are three sets of symptoms, each set occupying about a week, it is convenient to consider the continued fever in three weekly stages. In the first week, in addition to the symptoms above noticed, the heat of the skin becomes increased, and the pulse, at first hard, becomes soft and weak and more frequent than in health, often rising to 120, and in severe cases reaching 130 or 140 beats in a minute. According to Dr. Jenner, the pulse in uncomplicated *typhus* gradually rises to a maximum, preserves that rate for a variable time, and then slowly falls; while in *typhoid* it rises

and falls irregularly. There is considerable thirst; the tongue becomes clammy and dry, and its centre is covered with a white fur, which is often mesially divided by a straight brown streak, which is the first step to the blackness of that organ which afterward ensues. The intelligence is blunted; but on being sharply spoken to, the patient still gives rational answers. As the week advances, the strength is so reduced that he lies on his back and is unable to turn about in bed without assistance. In the second week the pulse becomes more frequent, weaker, and more compressible, and the tongue grows drier and browner. The teeth and lips are invested with dark sordes, consisting of morbid epithelium that had been shed; and the weakness is now so extreme that the patient sinks down in his bed. His voice becomes very feeble, and in bad cases he cannot swallow, nor can he put out his tongue. The two most remarkable symptoms of the second week are the delirium which seems to replace the headache about the ninth day, and the characteristic eruption. The delirium usually appears on the patient's awakening from sleep. He is inattentive to all that goes on around him, and usually lies still, muttering disjointed sentences, like a man talking in his dreams. Sometimes, however, he is more actively delirious, talking loudly, and trying to leave his bed. He may sometimes be roused by a strange voice, but soon relapses into his previous state. The senses are in a disturbed condition, the patient being commonly deaf, and, in advanced cases, often suffering from *Muscæ Volitantes* (q.v.), which gives rise to attempts to grasp these visionary objects, or to pick them from the bedclothes. This symptom, which is known in medical language under the name of *Floccitatio*, is almost certainly indicative of a fatal result. The characteristic eruption, which Dr. Jenner calls the *mulberry rash*, may show itself as early as the fifth day, but appears usually at the beginning of the second week, and sometimes a little later. The characters of the rash vary with its age. It consists of very slightly elevated spots of dusky pink. Each spot is flattened on its surface, irregular in outline, with no well-defined margin, but fades insensibly into the hue of the surrounding skin, disappears completely on pressure, and varies in size from a point to three or four lines in diameter. In two or three days these spots undergo a marked change. They no longer remain elevated above the surrounding cuticle; their hue becomes darker and more dingy than at first, and they now only fade on pressure, instead of completely disappearing. From this state they commonly grow paler, pass into faintly marked reddish-brown stains, and finally disappear. The spots composing this mulberry rash are generally very numerous, close together, and occasionally almost covering the skin. Sometimes, however, they are very few in number, at some distance from one another, and not to be distinguished at first from the *rose-spots* which, as noted below, occur in typhoid fever. The mulberry rash is usually on the trunk and extremities, but is

occasionally limited to the trunk, and in rare cases is seen on the face. No fresh spots appear after the third day of the eruption, and the rash subsides between the 14th and 21st days. The mulberry rash, though characteristic of typhus when it occurs, is not an essential symptom of the disease. Dr. Jenner states that in patients less than 15 years old, in whom the mortality is not more than 5 per cent., it is mostly either absent, or pale in hue and scanty in quantity; while in persons more than 50 years of age, in whom the mortality is about 46 per cent., the rash is always present, and usually dark and abundant. Hence, as in small-pox, the degrees of development of the eruption may be taken as a direct measure of the intensity of the disease. In this second week death is most apt to occur. Among 25 fatal cases noted by Jenner, only nine deaths occurred after the 15th day, and not one after the 20th. If the case is going to terminate fatally, symptoms commonly and expressively termed *putrid* set in; a peculiar fetor is exhaled from the breath and the surface of the body; the tongue is dry, black, and fissured; the teeth are covered with dark sordes; and sloughing bed-sores occur. The prostration increases to the last degree, and *subsultus tendinum*, or involuntary twitchings of the muscles of the face and arms, make their appearance. In some cases the ordinary stupor is replaced a day or two before death by the condition known as *coma vigil*. In this condition the patient never sleeps, but lies on his back, with the eyelids widely separated, eyes staring and fixed in vacuity, mouth partially open, and face pale and devoid of expression. He is totally incapable of being roused to give a sign of consciousness, the pulse and breathing are hardly perceptible, and the skin is cool. The occurrence of death is marked only by the eye losing its slight lustre, and the chest ceasing its slow and feeble movements. During the third week the symptoms gradually abate in those cases which are going to end in recovery. The patient often falls into a profound, quiet, and prolonged sleep between the 14th and 17th day, from which he awakes with decided general improvement. The complexion is clearer, the delirium has disappeared, the pulse has fallen, and the tongue begins to show signs of moisture at the edges. In a few days the tongue gradually becomes clean, the appetite becomes ravenous, and from that time the patient rapidly gains strength. In many cases the amendment is so gradual that it is impossible to say when it begins; and occasionally the favorable crisis is preceded by a temporary aggravation of the symptoms. A profuse sweat sometimes accompanies the favorable change. In the cases that terminate fatally there is no rallying from the symptoms described as occurring in the second week.

Typhoid Fever presents symptoms so similar to typhus that it is sufficient to indicate the leading points in which it differs. Among the earlier symptoms (though they are sometimes postponed to the end of the first week), the most characteristic are abdominal pains and diarrhea. These are due to an ulcerated condition of the intestines

The diarrhea is either spontaneous, or continues after the operation of a purgative. The stools are loose and frequent; and either of dark color and fetid, or of yellow pea-soup-like appearance. The abdomen is found on examination unnaturally hard and resisting, tympanitic, and sometimes much distended; its shape is invariably the same, and somewhat peculiar. Its convexity is from side to side, and not from above downward. The patient is never pot-bellied, but tub-shaped; the cause probably being that the flatus occupies the colon, ascending, descending, and transverse. Pressure over the region of the cæcum frequently excites uneasiness, and usually gives rise to a peculiar gurgling movement, which is both audible and palpable, and doubtless arises from the intermixture of liquid and gaseous matters in the bowels. This gurgling is a still more common symptom at a more advanced stage of the disease, and is of the greater importance as it is rare in typhus or any other disorder. An eruption usually appears from the 8th to the 12th day of the disease. This typhoid rash is very different from that in typhus: it consists of slightly elevated papulæ or pimples, with their heads rounded, and their bases gradually passing into the level of the surrounding cuticle. These papulæ are circular and of bright rose-color, which fades insensibly into the hue of the surrounding skin. Throughout their whole course, they disappear completely on pressure, and reappear when the pressure is removed. Each papula lasts three or four days, and fresh ones appear every day or two after their first eruption. The number present at a time is usually 6 to 20, but the limits may range from 1 to more than 100. Their average size is a line in diameter, and they occur chiefly on the abdomen, chest, and back. As a general rule, no fresh spots occur after the 30th day. The diarrhea, to which reference has been made, continues with the progress of the disease, the patient often having three to six evacuations daily, and often unconsciously passing them in bed. This persistence of the diarrhea is one of the results of ulceration of the bowels. Another result of this ulceration is the hemorrhage from the bowels—one of the most alarming symptoms. It occurs most frequently during the third and fourth weeks, and varies from a mere stain to a large amount. Sometimes the blood thus poured out by ulceration of the mesenteric veins is retained in the bowel, and is discovered only after death; the clots being unable to pass through the valve of the cæcum. This hemorrhage is always an extremely bad symptom, and may either cause immediate death by fainting, or may so weaken the patient as to cause him to succumb to the disease.

The ranges of temperature in typhoid and typhus fever differ considerably from each other, and the range in a mild case of either differs considerably from the range in severe cases. In typhoid rapid changes of temperature occur on and after the 22d day, and in typhus about the 15th day. The average duration of *fatal* cases of typhoid was stated by Jenner at 22 days, and of typhus at 14 days; the

former disease may terminate *favorably* during the fourth week, and the latter from the 13th to the 17th day.

In cases of recovery from typhoid, a remarkable fatuity remains for a considerable time; a childishness of mind often remaining more than a month after apparent restoration to health. 'The patient generally wakes up, as it were, from the fever, a complete imbecile. The whole man is changed. He seems to have renewed his youth Childhood and infancy return, and the greatest care is necessary to prevent untoward events. *No man can be considered as fit for work or for general military service for three or four months after an attack of severe typhoid fever.*'

Typhoid fever is essentially a disease of childhood and adolescence, the average age at which it occurs being 21¼ years, and it being very rarely that a person aged more than 50 is attacked; while typhus attacks persons of all ages, from early infancy to extreme old age.

The appearances presented on the examination of the body after death are very different in these diseases. While in *typhus* the most common morbid appearances are a fluid condition of the blood; hyperæmia of the cerebral membranes, and increase of intercranial fluid; bronchial catarrh and pulmonary congestion, especially at the posterior part of the lungs, which are more or less collapsed; softening of the heart, liver, and spleen, and enlargement of the kidneys: in *typhoid* there is one constant and characteristic lesion—a morbid condition of the agminated glands (or glands of Peyer) and solitary glands of the small intestine, especially of the former. These morbid changes may be briefly summed up as follows: thickening, redness, tumefaction, and finally ulceration or sloughing of the glands, the ulceration always in the lower third of the small intestine. On the assumption that the natural office of Peyer's glands is, as Dr. Carpenter suggests, to separate noxious matters from the blood, and to discharge them into the intestinal canal, Dr. C. J. B. Williams suggests that the ulceration so constant in typhoid fever may result from the continued operation of the poison of that disease, thus escaping. When these changes proceed as far as ulceration, the case is one of extreme danger, though death does not necessarily ensue, because the scars left by healed ulcers are often seen when patients who have had typhoid fever have subsequently died from some other disease. The existence of these ulcers is, however, likely to prolong the illness after the fever itself has ended; to hinder recovery; and to endanger life, even in cases of apparent convalescence, by causing hemorrhage or perforation of the bowel. This perforation, which gives rise to intense peritonitis, occurs in about one in five fatal cases, and takes place usually through the ileum near the valve.

We proceed to notice the origin and mode of propagation of these two diseases, beginning with *typhus*. There is undoubted evidence that all the forms of continued fever are contagious, and it may now be regarded as established that one species of fever cannot generate another, but that each is produced solely by its like; that typhus, e.g., always

propagates typhus, and never any other form of fever, as typhoid or relapsing fever. Some persons may, by some peculiarity of constitution, be able to resist the action of the poison, while others are peculiarly susceptible to it. An attack of fever generally exerts a certain amount of protective power against another attack of the same kind of fever; and *habit* has a good deal of power in fortifying the system against contagion, just as confirmed drunkards or opium-eaters can with impunity swallow doses of their respective poisons which would prove highly dangerous to a novice. 'Upon this principle has been explained the comparative immunity from contagious diseases, under like circumstances of exposure, of medical practitioners and nurses; of the keepers of filthy lodging-houses, while the new-coming inmates suffer; and even of prisoners, who, without having had the disease themselves, may nevertheless carry forth and communicate the infection. Whether typhus can be generated *de novo* by great overcrowding and vitiation of air, by the organic impurities emanating from the respiratory and other functions, is still a question. The conditions essential to its propagation are (1) overcrowding, combined with deficient ventilation; (2) personal filth, and clothes saturated with cutaneous exhalations; and (3) impaired condition of the system, such as may result from insufficient food, scurvy, and any other debilitating causes. The patient is most dangerous as a focus of infection after the end of the first week to the period of convalescence, the peculiar odor from the skin and lungs being then the strongest. If the poison be very concentrated, the disease may be caught by exposure to it for only a few minutes. The infected person may actually be conscious when the poison is taken in: one eminent physician states that this happened in his own case, from casually inhaling the breath of a person suffering with the disease. The most common latent period is nine days.

Investigations have shown that the living human body is the soil in which the specific poison of *typhoid* fever breeds and multiplies. The origin of the disease is unknown, but the poison is communicated or contained in the diarrheal discharges which issue from the diseased intestine. These discharges, as they dry up, preserve the germs of the disease; and if, through atmospheric or other agencies, these germs enter the living body, they communicate the disease, and the diarrhea soon begins. As the evacuations contain the specific virus of typhoid fever, the disease may be propagated among healthy persons (1) by percolation through the soil into wells which supply drinking-water; (2) or by issuing, through defects in the sewers, into the air which is breathed; or (3) by exhalation through the apertures of small ill-trapped water-closets or privies, which are at once the receptacles of the discharges from the sick and the daily resort of the healthy. The atmosphere thus infected with the poison is far more dangerous than that immediately surrounding a fever-patient.

It is the general belief of men eminent in medical science that if the means of checking the spread of typhoid fever

are thoroughly and efficiently used, its recurrence might be entirely prevented. To judge of the extent of the infection to be destroyed, two points are to be considered—*first*, the amount and duration of the intestinal discharge in each case; *secondly*, the number of cases actually occurring. With regard to the first point, the diarrhea lasts, on an average, 15 days. With regard to the second point, there are many scores of thousands of typhoid-fever cases annually in the country, each discharging for a fortnight floods of liquid charged with the specific poison of a communicable disease. The following details of procedure should be invariably attended to as soon as this disease appears: 1. All discharges from the fever-patient should be received, on their issue from the body, into vessels containing a concentrated solution of chloride of zinc. 2. Two ounces of a caustic solution of chloride of zinc should be put in the night-stool on each occasion before it is used by the fever-patient. 3. All tainted bed or body linen should immediately on its removal be placed in water strongly impregnated with the same agent. 4. The water-closet should be flooded several times a day with a strong solution of chloride of zinc; and some chloride of lime also should be placed there, to serve as a source of chlorine in the gaseous form. 5. So long as fever lasts, the water-closet should be used exclusively as a receptacle for the discharges from the sick. (It has been attempted to prove that typhoid fever, like diphtheria, relapsing fever, and some other maladies, is caused by the entrance into the system of a specific bacterium; and that such specific organism has a part in propagating the disease is highly probable; but the pathogenic micro-organism of typhoid has not yet been proved: see GERM-THEORY.)

Although typhoid is contagious, it is much less so than typhus. Hence in typhus a large room should, if possible, be selected for the patient, and the air should be kept fresh by having a window or a door, or both, open. Curtains, carpets, and all superfluous furniture should be removed, and the body of the patient should be kept as clean as possible by ablution, and his sheets and night-shirt frequently changed; the latter being at once plunged into water containing chloride of zinc. All who approach the sick-bed should avoid as far as possible inhaling the patient's breath or the emanations from his skin. Friends occasionally visiting the patient should do so after a meal and a glass of wine or ale. Formerly it was the practice to distribute cases of typhus fever in the general wards of hospitals—the rule being to distribute them scantily among the general patients. This practice has been discarded; and now each hospital is provided with its fever-house to which cases of typhus are strictly limited.

From careful critical study of the history of fever generally, including chemical and microscopical examination of the excretions, a high medical authority arrives at the conclusion that the *general treatment of fever*, including typhus and typhoid fevers, may be summed up 'as being a combination of measures to *reduce excessive heat, to in-*

sure proper excretion, and *to act on the semi-paralyzed nerves.'*

The special indications for treatment of *typhus* are: 1. To neutralize the poison, and to correct the morbid state of the blood. Hydrochloric acid is strongly recommended for this purpose; it may be given to the extent of a fluid ounce of the dilute acid daily, mixed with a quart of barley-water sweetened with syrup of ginger and flavored with lemon-peel. 2. To eliminate the poison and the products of the destructive metamorphosis of tissue. For this purpose, alkaline salts may be prescribed to act on the kidneys and skin, and purgatives are often useful. 3. To reduce the temperature. 4. To sustain the vital powers, and to obviate the tendency to death: nourishment in the form of milk and water, coffee, broth, beef-tea, etc., must be administered at least once in every three or four hours, after the fourth day of fever, and alcoholic stimulants are usually serviceable about the seventh or eighth day. Great discrimination is required in prescribing them, and we are indebted mainly to the Dublin school—to Graves and Stokes—for pointing out the importance of the cardiac and radial pulses as guides for the use of alcohol in fevers. When the cardiac impulse becomes weak, and when the first sound of the heart is impaired or absent, stimulants should be freely given; and an irregular, intermitting, abnormally slow, or imperceptible pulse affords a similar indication. 5. To relieve the distressing symptoms, such as the headache, sleeplessness, and delirium; and 6. To avert and subdue local complications.

In *typhoid fever*, the chief indications of treatment are: 1. To reduce the temperature, and subdue any excessive vascular excitement. 2. To restrain excessive diarrhea, for which purpose milk and lime-water in equal parts may be taken as a drink. The discharge ought not to be altogether checked; and some authorities even prefer giving saline laxatives to astringents, recommending that at the same time the lower bowel should be unloaded by warm-water injections, to which a little asafetida or anise-seed is added. In cases in which it is doubtful whether to check or encourage diarrhea, the physician will generally be on the safer side if he discourages the action of the bowels. 3. To stimulate the nervous system by proper food, and possibly by stimulants. 4. To maintain the free action of the kidneys, effected best by small doses of the alkaline carbonates, or of cream of tartar. 5. To influence the elimination of morbid matter from the affected intestinal glands. For this purpose, 1 or 2 grains of calomel should be given twice a day till about the tenth day, but not later. Special symptoms, such as great inflation of the abdomen (known as meteorism), hemorrhage from the intestines, etc., must be treated by the ordinary rules: probably the best single remedy for this form of hemorrhage is oil of turpentine in doses of 5 to 20 drops every hour or two—administered best in an emulsion with gum arabic, white sugar, and water. The diet is of utmost importance from the beginning of the disease till complete

recovery ensues. From the various forms of farinaceous food, e.g., corn-starch, arrowroot, rice, sago, tapioca, bread, etc., from eggs beaten into custard, and milk with or without lime-water (or, preferably, aerated water), an abundant, bland, and nourishing dietary can be selected. All animal food, except eggs and milk, must be rigidly prohibited. Even beef-tea and mild broths have often been found to exert a special irritant action on the overcharged glands of the ileum. During convalescence, no meat should be allowed till at least a week has elapsed after all febrile symptoms have vanished; and the only admissible means of opening the bowels are by castor-oil or simple enemata. As liability to typhoid diminishes with age, middle-aged attendants should be selected.

Both typhus and typhoid fever have been described under various names. Typhus has been popularly known as the jail fever, hospital fever, putrid fever, brain fever, bilious fever, spotted fever, camp fever, ship fever, etc.; while, from the peculiar lesions associated with typhoid, the terms enteric fever and intestinal fever have been suggested as appropriate synonyms for it. The name pythogenic fever, or fever born of putrescence, also has been given to typhoid. If the term *intestinal fever*, suggested by Dr. W. Budd, were adopted, much confusion would be prevented. Cases of continued low fever, whether typhus or typhoid, are frequently spoken of popularly and vaguely as *gastric* fevers; but the term is not recognized by the medical profession as applying in this sense. Gastritis, or inflammation of the stomach, is of course accompanied by feverishness, like all inflammations.

During the first 15 years of the 19th c. the ravages of typhus in the armies of Napoleon, and among the population of the European countries which were the seat of war, were appalling. 1812, May, the Bavarian army serving with the French numbered 28,000 men; 1813, Feb., the number was reduced to 2,250, the great destroyer being typhus. In Mayence alone, of 60,000 French troops composing the garrison 1813–4, there died of typhus alone, in six months, 25,000 men. During the spring of 1856 more than 17,000 men of the French army in the Crimea perished from typhus in less than three months. According to Parkes, typhus fever occupies the fourth place among the causes which have produced loss of life in the Brit. army, the three more potent causes being: (1) a defective commissariat; (2) undertaking military operations in an unhealthful site and with an unhealthful season impending; (3) exposure to cold, with insufficient clothing and food.—For further details of these two important diseases, see articles on Typhus and Typhoid fevers in Quain's *Dictionary of Medicine* (1882).

TYPIC, TYPICAL, TYPIFY: see under TYPE.

TYPOGRAPH, *tī'pō-grăf*, a type-making and type-setting machine of recent invention.

TYPOGRAPHY, n. *tī-pŏg'ră-fĭ* [Gr. *tupos*, a type or figure; *graphō*, I write]: the art or operation of printing (see below). particularly, the preparation of matter in type for printing, or the result of that printing as regards general character and appearance, as, the *typography* is good (see below). TYPOGRAPHIC, a. *tī'pō-grăf'ĭk*, or TY'POGRAPH'ICAL, a. *-ĭ-kăl*, pertaining to the art or act of printing; employed or made in printing; in *OE.*, emblematic; figurative. TY'POGRAPH'ICALLY, ad. *-lĭ*. TYPOGRAPHER, n. *tī-pŏg'ră-fĕr*, a printer.

TYPOG'RAPHY: printing from a surface in relief; letter-press printing, whether from movable type, or from stereotype or electrotype plates made from movable type, or from engraved blocks of wood such as are used for illustrations in books or are in use among the Chinese, etc., and still to some extent in Japan for book-work (see XYLOGRAPHY); or, lastly, from plates prepared by photo-zincography, photogravure, and similar processes. T. is thus distinguished (1) from *Chalcography* (q.v.), or copper-plate printing, in which the lines are incised on a metallic surface; and (2) from *Lithography* (q.v.), in which the lines to be reproduced are written or drawn on the smooth face of a certain kind of stone.—The term is applied also to the general character or appearance of printed matter: thus, we may speak of the T. of a work as very poor, good, etc.

TYPOLOGY, n. *tī-pŏl'ŏ-jĭ* [Gr. *tupos*, a type or form; *logos*, discourse]: the doctrine of types or figures: see TYPE.

TYR, *tĭr:* in Old Norse mythology, the god of war; called in Anglo-Saxon *Tiv*, *Tiw*, and in Old High German *Ziu* or *Zio*. He was son of Odin, and was, according to the Edda, single-handed. When the Asa-gods persuaded the wolf Fenrir to allow himself to be bound with the bandage Gleipnir, Tyr put his right hand in the wolf's mouth, as a pledge that he would be loosened; and when the gods refused to release him, the wolf bit off Tyr's hand to the wrist, which was called, in consequence, *Ulflithr*, or the Wolf's Joint. In the twilight-battle of the gods, he meets his death at the same time with his enemy, the monster dog Garmr. The Old Norse Runic character ↑ bore the name of the god. The third day of the week, too, the *Dies Martis* of the Romans, is called after him, in Old Norse, *Tyrsdagr;* Ang.-Sax. *Tivesday* (from which our English *Tuesday*); Old Friesic, *Tysdei;* Old High German, *Ziuwestac;* in n. Germany, *Tiestac* or *Diestac*, from which the German of the present time, *Dienstag*. Places, and particularly hills and plants, were named after him. The word Tyr appears in epithets of Odin, signifying god in a general sense—e.g., *Sigtyr*, i.e., the god of victory; also in epithets of Thor, as *Reidhartyr*, god of the chariot or of thunder.

TYRANT, n. *tī'rănt* [L. *tyrannus;* Gr. *turannos,* a ruler, a king: It. *tiranno;* F. *tyran*]: *originally,* a king or ruler, especially one who had obtained power illegally; a usurper; *now,* a ruler or sovereign who uses power to oppress; one who abuses his rule or authority by acts of oppression and cruelty; a despotic ruler; an oppressor. TYRANNICAL, a. *tī-răn'nĭ-kăl,* pert. to a tyrant, that acts as a tyrant; unjustly severe; arbitrary; despotic; cruel. TYRAN'NICALLY, ad. *-lĭ.* TYRAN'NICALNESS, n. *-nĭ-kăl-nĕs,* despotic disposition; oppressive exercise of power. TYRAN'NIC, a. *-nĭk,* in *poetry,* tyrannical. TYRAN'NICIDE, n. *-nĭ-sīd* [from *tyrant,* and L. *cædo,* I cut, I kill]: the act of killing a tyrant; one who kills a tyrant. TYRANNIZE, v. *tĭr'ăn-nīz,* to act the part of a tyrant; to rule with unjust and oppressive severity. TYR'ANNIZING, imp. TYR'ANNIZED, pp. *-nīzd.* TYR'ANNOUS, a. *-nŭs,* tyrannical; arbitrary. TYR'ANNOUSLY, ad. *-nŭs-lĭ.* TYR'ANNY, n. *-nĭ,* the government or acts of a tyrant; an arbitrary or despotic exercise of power; cruelty; unjust severity.—*Tyrant,* in modern usage, is an arbitrary and oppressive ruler; but originally it meant a ruler who had obtained power illegally, and was therefore equivalent to our word *usurper.* The ancient Greek 'republics' were generally aristocratic and even oligarchic in their constitution. When the 'governing families' among the Athenian or Syracusan nobles, e.g., quarrelled with each other, it was natural, if they could not otherwise agree, that the boldest and most reckless of the set should seek for success by allying himself with the masses of the people, should figure as their champion, promise to redress their wrongs or increase their comforts, and, when a fitting occasion offered, should, by a clever or violent stratagem—*coup d'état,* it is now called—deliver them from the domination of his order by himself grasping absolute power, and ruling without any other restraint than the necessity of retaining his popularity—even this limitation being frequently absent when a bodyguard of foreign mercenaries rendered it superfluous. If the political adventurer who thus rose on the ruins of the constitution happened to be a man of sense and wisdom and generosity, his 'tyranny' might prove a blessing to a state torn by the animosities of selfish oligarchs, and be the theme of praise in after-ages, as was the case with the 'tyrannies' of Peisistratos (q.v.), Gelon (q.v.), Hiero II. (q.v.), and many others; but if he was insolent, rapacious, and cruel, then he sought to reduce the citizens to a worse than Egyptian bondage, and his name became infamous to all time—e.g., most of the 'Thirty Tyrants of Athens' (q.v.), particularly the blood-thirsty Critias, Alexander of Pheræ, Dionysius the Younger, etc. Such outrages gave the word tyrant in later antiquity that evil significance which it has ever since retained.—See Plasz, *Die Tyrannis bei den Griechen* (Bremen 1852); Wachsmuth, *Hellen. Alt.,* I. 279-288; and Histories by Thirlwall and Grote.

TYRANT-SHRIKE, or TYRANT FLY-CATCHER: see KING-BIRD.

TYRCONNEL, *tĭr-kŏn'nĕl* (RICHARD TALBOT), Duke and Earl of: born early in the 17th c., d. 1691, Aug. 14. In his youth, according to Lord Macaulay, he was 'one of the most noted sharpers and bullies of London.' Soon after the Restoration (q.v.), he contrived to make himself welcome at the palace both as a votary of its pleasures and as a counselor in affairs of state. Immediately on the accession of James II., he was made earl of T., and put in command of the troops in Ireland; and, 1687, by fawning, bullying, and bribing, he got the office of lord-deputy of Ireland. His arrival in that country spread dismay through the Eng. Prot. population. Nearly every office of dignity in the country was soon transferred to the hands of Roman Catholics. The long-dominant Prot. party complained bitterly that appeal to law was vain; judgment in every case being given for the native against the Englishman. But the revolution of 1688 had a sobering effect on his rule, and he would probably have submitted to William III.; but the Irish people threatened that, if he dared sell them for wealth or honors, they would burn the castle and him in it, and put themselves under protection of France. On James's arrival in Ireland 1689, the earl was created Duke of Tyrconnel. After the fatal battle of the Boyne (q v.), at which he held high command, he retired to France. In 1691 he returned to Ireland, to further the efforts still made in behalf of James. Notwithstanding the defeat of Aghrim (1691, July 12) and the capitulation of Galway, he made preparations for defense of Limerick, binding himself and his countrymen by an oath not to surrender until they received permission from James, then at St. Germain—at the same time dispatching a letter in which he stated his conviction that all was lost. Before an answer could arrive, he was struck with apoplexy, and died.

TYRE, *tīr* (Phœn. *Sûr* or *Sôr*, rock): the most famous city of ancient Phœnicia, lat. 33° 12′ n., named probably from the double rock on which it was first founded. It was doubted among the ancients themselves whether T. or Sidon was the older, and the question is not settled; though it seems certain that T. had long existed independently when Sidon, defeated by Ascalon, transferred herself almost bodily to T. (see PHŒNICIA). There were two towns of T. closely connected in historical times—one on the continent, the other on the island opposite, together comprising (according to Pliny) about 19 Roman m. The more important of the two was the continental town, Palæ Tyrus; while the island-town served more or less for storehouses, manufactories, arsenals, and the like. The entire city was in a fertile region; and its magnificent combination of land and sea scenery formed the theme of many an ancient poet and seer.

Nothing but myths have come down to us respecting T. in its earlier period. Its history dawns on us with Abibal, predecessor of the biblical Hiram, under whose rule (B.C. 980–947) T. attained its full glory and renown. An alliance with Solomon was entered into; trading expeditions were undertaken jointly by the Israelites and the Phœni-

cians; and Solomon is supposed even to have married Hiram's daughter. During Hiram's reign, T. was much enlarged and embellished; and its two roadsteads and harbors, among the wonders of the ancient world, date probably from the same period. He was followed, according to ancient writers, by Balæastartus; after him reigned, for brief periods, his four sons, by the murder of the last of whom the throne became hereditary in the House of Ithobaal, the Ethbaal of Scripture, whose daughter was married to King Ahab. T. then appears to have gained the supremacy over Sidon, and also spread her colonies far and wide. Shortly after the death of this king, Carthage was refounded by Elissa (Dido), about B.C. 813, in consequence of a popular demonstration which deprived her of the throne in favor of Pygmalion. This 'new city' gradually diminished the importance of the old one; at least T. seems to have been weakened to such an extent by the emigration of its best elements that it disappears from history until the three great powers, Chaldæa, Assyria, and Egypt, by turns endeavored to make themselves masters of the Tyro-Phœnician coast, with its e. and w. trade. Shalmaneser, King of Assyria, reduced T., after a long siege; and the whole of Phœnicia, the most important places of which had already thrown off their allegiance to T., was rendered tributary to Assyria. During the Chaldæo-Egyptian struggle, T., again at the head of the country, sided with Egypt and was conquered by the Chaldæans. Once more the Phœnicians attempted to throw off the foreign yoke, and Nebuchadnezzar marched against them at the head of his armies. Having taken Jerusalem B.C. 587, he reduced the whole sea-coast, except T., which stood 13 years' siege by water and by land, ending, not in subjection, but only in an apparent submission, leaving the native sovereigns on their thrones, and their wealth and power untouched. In B.C. 538 Cyrus became master of Phœnicia, which at that time again was under Babylonian supremacy; and the hegemony was bestowed on Sidon. For a long time Phœnicia prospered under wise Persian rulers; but when Xerxes, in his Greek wars, had completely destroyed the Phœnician fleet, and exhausted nearly all her resources, the exasperated inhabitants rose once more, but only to be utterly crushed. Sidon, at the head of the revolution, was fired by its own inhabitants, and again T. resumed the lead (B.C. 350). Having refused to pay allegiance to Alexander the Great (after the battle at Issus), it was besieged by him B.C. 332, and fell after seven months' hard resistance. Alexander replaced the old inhabitants by new colonists, chiefly Carians; and though the city had been almost destroyed, it rose again after a brief period to wealth and power, and B.C. 315 was able to hold out 18 months against Antigonus. Under the Romans, Cleopatra received T. as a present from Antony; but the last trace of its independent existence was taken from it by Augustus. A Christian community had then been founded there. The trade and manufacture of T., aided by its exceptionally favorable naval position, gave it, even under Roman domin-

ion, a high place among its sister cities; and once again, A.D. 193, it even took active part in the contest between Septimius Severus and Pescennius Niger, which, resulting in the success of Severus, brought back to it some of its ancient distinction. In St. Jerome's time it was again the most beautiful city of Phœnicia, and one of the most prosperous cities of the whole East. In the 7th c. it came under the dominion of the Saracens, and so remained until taken by the Crusaders; and in 1192 became the n. boundary of Christian territory in Palestine. It continued to flourish—still chiefly through its renowned manufacture of purple—until 1516, when the conquest of Selim I., together with the newly discovered route to Asia by the Cape of Good Hope, put an end to its wealth and commerce, and almost to its existence. Although there has been a slight improvement in its prospects of late, the magnificent city of old still presents a scene of desolation and wretchedness. About 5,000 inhabitants now dwell in Sûr, among the ruins of its ancient glory, finding scanty livelihood in exports of tobacco, cotton, wool, and wood.

TYRIAN, a. *tĭr'i-ăn:* pertaining to anc. *Tyre;* richly purple, as from the anc. Tyrian dye: N. a native of Tyre.

TYRNAU, *tĭr'now* (Magyar, *Nagy-Szombath*): town of Hungary, county of Ober-Neutra; on the river Trna, about 30 m. n e. of Presburg. It has so many churches and convents that it has been nicknamed 'Little Rome.' There are manufactures of cloth, linen, woad, etc., and a general trade, especially in wine. 1635–1774 it possessed a univ., which was transferred (1774) to Pesth. T. is noted for a huge cask, holding twice as much as the Heidelberg tun.—Pop. 11,000.

TYRO, n. *tī'rō* [L. *tiro,* a young soldier: It. *tirone*]: a beginner in learning; one engaged in learning the mere rudiments; a novice; a person having an imperfect or slight knowledge of the subject. TY'RONISM, n. *-rō-nĭzm,* the state of being a tyro; novitiate.

TYROL, *tĭr'ol,* Ger. *tē-rōl'* (in German commonly spelled *Tirol;* not spoken of as *das T.*, though usually called among English-speaking people *The T.*): Austrian province (with Vorarlberg), the most westerly of the Austro-Hungarian monarchy; bordering n., w., and s. on Bavaria, Switzerland, and Italy; 11,280 sq. m., including Vorarlberg.—Pop. (1900) including Vorarlberg, 981,949.

Surface.—The T. may be regarded as an e. continuation of Switzerland. It is traversed from e. to w. by the great chain of the Alps, and is encircled by lofty ranges. It consists, however, almost entirely of three great valleys—(1) one running e. and w. n. of the Great Alps, and drained by the Inn; (2) one s. of the Alps, also running e. and w. and drained by upper tributaries of the Adige or Etsch; (3) one running s. from the middle of the second, and drained by the main stream of the Adige. These valleys are surrounded by a circuit of mountains. The n. valley is separated from Bavaria by the Algau Alps. The s. valley is bounded e. by the Trent Alps; w. by the

Ortler Alps, which, like protecting walls, extend s. into the plain of Lombardy. The main chain is crossed toward the centre of the T. by a deep depression, in which is the Brenner Pass (elevation 4,657 ft.)—lowest of the great passes of the Alps, and that over which runs the great commercial route between Italy and Germany.

The dialect and manners of the Bavarians prevail in the n. and middle valleys. The dialect and manners of Lombardy, on the other hand, have crept up the third valley to a boundary line which rests on the mountains that bound the middle valley on the s. Hence the most important divisions of the T. are the German T. and the Italian T.—The German T. is divided into (1) the Oberinnthal, or the Upper Inn Valley; (2) the Unterinnthal, or the Lower Inn Valley; (3) the Vintschgau; (4) the Etsch district; (5) the Pusterthal—the last three belonging to the middle valley of the Tyrol. Beyond the geographical limits of the T., the Austrian province of the T. includes (6) the Vorarlberg, a dist. drained by streams which fall into the Lake of Constance, and in which a dialect is spoken resembling the dialects of German Switzerland; and (7) the Lienz district, on the Drave, in which the language is Austrian.—The Italian T. is divided into (1) a n. valley, that of Trent; (2) a s. valley, that of Roveredo; (3) the valley of the Sarca, or dist. of Riva, on Lake Garda.

Geology and Soils.—The rocks are chiefly crystalline Silurian and Secondary, with obtruding granites and traps. The chief mineral products are iron, rock-salt, worked near Innsbruck, and marble, quarried in the south. The Tertiary strata of the Swiss and Swabian plains are totally lacking; and only along the water-courses are found level tracts of recent formation. These tracts are the only parts of the country admitting cultivation by the plow, and they very seldom attain a width beyond half a mile.

Climate.—The loftiest mountains are—in the main chain of the Alps—the Gross Glockner (12,776 ft.), e. of the Brenner Pass, and Mt. Gebatsch (12,276 ft.), w. of it; and, in the Ortler chain, the Ortler Spitz (12,818 ft.). These mountains are covered with vast glaciers, extending, like those of Switzerland, far down into the valleys. Between 6,000 and 5,000 ft. of altitude, snow disappears in summer, and alpine plants and grass cover the hills, diversified here and there with stunted bushes. Into this region the herds are driven, as in Switzerland, during summer. Below 5,000 ft. firwoods abound; potatoes and a few vegetables are cultivated, and houses permanently occupied make their appearance. The beech replaces the fir at 4,000 ft., and agriculture begins, the chief grains being rye and barley. Wheat is not cultivated with success higher than 2,000 ft. In the lower part of the s. valley, the temperature is highest, and, indeed, the climate is that of n. Italy; tobacco, the fig, the olive, and the mulberry being among the chief objects of cultivation. Out of every 100 acres of the T., 30 acres are inaccessible mountain tracts, 40 acres forests, 20 acres commons and meadows, and 10 acres corn-fields and gardens.

Industry.—The industries are not important. There are, however, glass and paper factories near Innsbruck; and carpets, linens, gloves, and straw hats are manufactured extensively for home consumption. Woodenware also is largely produced. The rearing of canaries was long a monopoly of the n. Tyrolese, who supplied all Europe with these birds. Exports from the T. consist of cattle, cheese, timber, wine, tobacco, silk, iron, and salt; imports are grain and manufactured goods. The transit-trade between Italy and Germany employs many of the inhabitants. Thousands migrate annually into neighboring countries, to sell their wood-wares, gloves, and carpets. Railways connect Innsbruck with Munich, and Botzen with Verona; and the section between Innsbruck and Botzen, over the Brenner Pass, opened 1867, completed the first railway-communication between Italy and Germany.

Inhabitants.—The N. or German Tyrolese bear to the S. or Italian the proportion of three to two; and the habits and language of the two populations resemble those of adjoining parts of Italy and Germany. In the T., according to the census, the inhabitants all are Rom. Catholics, except 358 Jews, 1,235 Protestants, 29 Greek Christians, and a few members of other sects. The Tyrolese have an independent national diet, meeting at Innsbruck, in which are represented all classes of the population, the clergy, the nobility, the people of the country, and those of the towns. There are, to some extent, separate administrative arrangements for the Italian districts. Education is now generally diffused, and one of the nine Austrian universities is at Innsbruck.

History.—The history of the T. is partly German, partly Italian. In early times the T. formed part of Rhætia, and was conquered by the Romans B.C. 15. Subsequently it was overrun by various German tribes; still later the s. valley fell to the share of the Lombards, the two n. valleys to the Bavarians. The latter valleys were divided into *gaus*, which ultimately became petty lordships, acknowledging the supremacy of the dukes of Bavaria. These lordships, however, in time came to be represented by two families who intermarried. Then the whole German T. was governed by one family of counts, whose paternal abode was the mountain fortress of Terioli, or Tyrol, near Meran. The last count (d. 1335) left one daughter, Margaret Maultasche. She bequeathed her rights to her cousins, the dukes of Austria, who thus acquired possession of the T. 1363. The Italian valley formed the bishopric of Trent. During the wars of Napoleon, the German T. was ceded to Bavaria, much to the discontent of the population, who were warmly attached to the House of Austria. They made a gallant resistance to the French 1809, under Andreas Hofer, but were defeated, and the Northern T. was not restored to Austria until the treaty of Paris 1814. The Southern T., which had been annexed to Italy, was restored to Austria in the following year. An application was made by the inhabitants of the Italian T., a few years ago, to the Austrian govt., to be

rendered entirely independent of the German inhabitants of the n. valleys—which, though leading to no important change, showed the desire of the Southern Tyrolese to be considered Italians rather than Germans; and it was believed that, on the event of a successful war for the recovery of Venice, the whole of the Southern T. would be transferred to the kingdom of Italy. This expectation has not been realized. By the treaty of peace between Austria and Italy at the end of the war through which Venetia again became Italian, it is declared that the frontiers of the Venetian provinces ceded to Italy are the administrative frontiers of these provinces under the Austrian rule. Even the shores of Lake Garda remain Austrian. How long this arrangement will last, is not to be predicted. The trade of the Southern T. is entirely with the south, its wood and cattle being exchanged for the grain of Lombardy. Of late there has repeatedly been agitation in Italy for securing incorporation with that kingdom of what is called *Italia Irredenta* ('unredeemed Italy'), which includes, with Trieste and part of the Dalmatian sea-board, the *Trentino* and Southern Tyrol.

TYROLESE, a. *tĭr'ō-lēz:* pertaining to the *Tyrol*, in Austria: N. the natives of the Tyrol, or one of them. TYROLIENNE, n. *tĭr-ō'lē-ĕn*, a melody or song of the Tyrolese mountaineers, characterized by yodels, or frequent changes from the natural to the falsetto voice.

TYRONE, *tĭ rōn':* borough in Blair co., Penn.; on Little Juniata river, and on the Pennsylvania railroad; 14 m. n.n.e. of Altoona, 131 m. e. of Pittsburgh. It is an important manufacturing place; has 6 churches, 1 national bank (cap. $75,000), 2 private banks, 1 daily and 2 weekly newspapers; bloom forge, railroad repair shops, and several planing-mills; and has large trade in iron products, flour, paper, leather, lumber, coal, lime, and furniture. —Pop. (1880) 1,840; (1890) 4,705; (1900) 5,847.

TYRONE, *tĭ-rōn'* (*Tir-owen*, 'Owen's country'): inland county of Ulster, Ireland: bounded n. by Londonderry, e. by Armagh and Lough Neagh, s. by Monaghan and Fermanagh, w. by Fermanagh and Donegal; greatest extent n. to s. 46 m., e. to w. 60; 1,260 sq. m., or 806 558 acres, of which 450,286 are arable, 311,867 uncultivated: of the arable land (1885), 237,528 acres were under crops. The surface, in general, is hilly, and often extremely picturesque, this county lying for the most part between the two mountainous districts which traverse Ulster from e. to w. The lakes, except Lough Neagh, are small. The principal rivers are the Blackwater, the Camowen, and the Ballinderry, the former two navigable. Railways connect the county with Dublin, Belfast, and the sea-coast at Dundalk. The geological structure is diversified. The n.w. mountains are chiefly mica-slate, with primitive limestone, and rise in Slieve Sawel 2,236 ft. Those on the n e. are of greenstone, with granite and occasional red sandstone. The plain, of which Omagh is the centre, is a Tertiary formation, with irregular beds of lignite, red marl, and new

red sandstone; and between Dungannon and Stewartstown is a small coal-field. The rest of the plain belongs to the general limestone district. The climate is moist, and the low lands are often flooded. The soil of the plain is a fertile loam; that of the hilly districts, sandy or gravelly. There is large proportion of bog, whose turf supplies the chief fuel. Among the chief towns are Omagh, and Clogher, which gives its name to the episcopal see. T., anciently known as the district of Hy-Briun and Hy-Fiachra, was in later Celtic times called Kinel Eogain, or Tir-owen, whence its modern name. See ULSTER.—Pop. (1841) 312,956; (1871) 215,766—of whom 119,937 Rom. Cath., 49,201; Anglican Protestants, 42,156; Presbyterians; (1881) 197,719; (1891) 171,278; (1901) 150,567.

TYROSINE, n. *tĭr'ō-sĭn:* a substance formed along with leucine in certain stages of digestion.

TYROTOXICON, *tĭr-ō-tŏks'ĭ-kŏn* [Gr. *turos*, cheese; *toxikon*, poisonous]: a putrefactive product sometimes found in milk and in cheese: to its action are due the symptoms of poisoning that sometimes ensue after eating ice-cream: see PTOMAINE.

TYRRHENIAN SEA, *tĭr-rē'nĭ-an* (anc. *Tyrrhenum Mare*): that part of the Mediterranean Sea (q.v.) between the islands of Corsica, Sardinia, and Sicily, on the w., and the Italian peninsula, on the east.

TYRTÆUS, *tėr-tē'ŭs:* Greek poet, famed for his political elegies and marching-songs: about B.C. 650. His birthplace is not known: a probable conjecture makes him son of Archembrotus, of Aphidnæ, in Attica; another conjecture is that he was a Lacedæmonian; and a legend, the growth of later times, represents him as a lame schoolmaster, of mean family, whom the Athenians (ignorant of his lyric power, and jealous of Lacedæmonian domination in the Peloponnesus) sent to the Lacedæmonians, during the second Messenian war, as the most inefficient commander they could select. T. rendered to the Lacedæmonians a kind of assistance which the Athenians little foresaw; for while by his elegies he stilled their dissensions at home, by his war-lyrics he so animated their courage in the field that they were finally triumphant in their conflict with the Messenians, whom they reduced to the condition of Helots. This success of his poems T. lived to see, and must accordingly have lived till B.C. 668, the last year of the second Messenian war. The best ed. of the text of T. is that of Bergk in *Poetæ Lyrici Græci.*

TYTLER, *tīt'lėr*, ALEXANDER FRASER (Lord Woodhouselee): Scottish judge and historian: 1747, Oct. 15—1813, Jan. 5; b. Edinburgh; eldest son of William T. (q.v.). He was educated in Edinburgh and at an excellent school in Kensington; and was admitted to the Scottish bar 1770. He obtained, 1780, a professorship of history in the Univ. of Edinburgh; 1790, the office of judge-admiral of Scotland; and 1802 was raised to the bench of the court of session. His acquirements were varied, comprising literature and the fine arts. His writings include

a biography of Henry Home, Lord Kames; a Dictionary of Decisions of the Court of Session (1778); and the work by which he is best known, *Elements of General History* (1801), which has been translated into most of the languages of Europe, and even into Hindustani.

TYT'LER, PATRICK FRASER: eminent historical writer: 1791, Aug. 30—1849, Dec. 24; b. Edinburgh; fourth son of Alexander Fraser T. (Lord Woodhouselee). He was educated mostly in Edinburgh, partly in England; and was called to the Scottish bar 1813. Of his various literary and historical works, the most valuable is *History of Scotland* (1828–43), beginning with the accession of Alexander III., and terminating with the union of the crowns; a book of more critical and original research than any previous work on the subject. Its style is clear and graphic. It was undertaken at the suggestion of Sir Walter Scott, and occupied its author 20 years. His writings include also a life of the Admirable Crichton, life of Wickliffe, memoir of Sir Thomas Craig, and a collection of original letters, illustrative of the reigns of Edward VI. and Mary. For his merits as a historian, Sir Robert Peel's govt. conferred on him a pension of £200 a year. He died at Great Malvern. T. was brilliant in society, and amiable and excellent in private character.—See Burgon's *Life* (1859).

TYT'LER, WILLIAM: historical and antiquarian author: 1711, Oct. 12—1792, Sep. 12; b. Edinburgh. He was educated at Edinburgh Univ., admitted a member of the Soc. of Writers to the Signet in 1744. He was father of Alexander Fraser T. (Lord Woodhouselee), and grandfather of Patrick Fraser T., the historian. T. was an accomplished musician, and distinguished for his general culture and taste in the fine arts. His principal work was an *Inquiry, Critical and Historical, into the Evidence against Mary Queen of Scots,* in which it is attempted to vindicate that unhappy princess from the charges brought against her by Robertson and Hume.

TZA'NA, LAKE OF: see DEMBEA.

TZAR, TZARINA: see CZAR.

TZETZES, *tsĕt'zēz,* JOHANNES: Byzantine (Greek) author: latter half of the 12th c. His works in prose and verse, though without a trace of literary genius, supply classical information not elsewhere found. The principal are: 1, *Iliaca*—three poems, entitled *Ante-Homerica, Homerica,* and *Post Homerica;* or, in Greek, *Ta pro Homerou, ta Homerou, kai ta meth' Homeron* (complete ed. pub. first by Fr. Jacobs, Leip. 1793; but best critical ed. by Bekker, Berl. 1816); 2, *Biblos Istorike,* commonly called *Chiliades*—collection of more than 600 stories, mythical, legendary, etc. (best ed. by Kiessling, Leip. 1826), written in that worthless sort of verse called *political,* which had regard only to syllables, and not to quantity: other works were commentaries on Homer, Hesiod, and the *Cassandra* of Lycophron. Several poems and commentaries of T. exist in MSS.—T.'s brother ISAAC probably had some share in the commentary on the *Cassandra.*

U

U, u: 21st letter and 5th vowel of the Eng. alphabet; representing in that language three distinct sounds, as heard in *tube*, *tub*, and *full* (the *u* in *full* having the sound of *oo* in *book*). The last (as in *full*) is its primitive sound, which it had in Latin, and which it has preserved in German and Italian, but which is denoted in English oftener by *oo* (as in *good*). In *tube*, *u* is not considered to mark a pure vowel sound, but to be slightly aspirated, almost as if coalescing with a prefixed *y*—*tyub*. The sound heard in *tub* is characteristic of English; and, owing, perhaps, to the decided emphasis given to one syllable of a word at the expense of the rest, there is a tendency to allow the other vowels, *a*, *e*, *o*, when unaccented, to degenerate into this indistinct, stifled sound: *cavalry*, *sister*, *fashion*, are pronounced almost, if not altogether, as if written *cavulry*, *sistur*, *fashun*. This is the case especially with *o*; and in *o* the degeneracy is not confined to unaccented syllables; in a whole host of words, the accented *o* is exactly equivalent to *ŭ*—e.g., *come*, *money*, *among*. Perhaps a similar tendency in Latin may account for the prevalence of *u* in that language as compared with Greek—e.g., L. gen*u*s = Gr. gen*o*s; vol*u*mus = bo*u*lometha; spat*u*la = spat*a*le; scop*u*l*u*s = skop*e*l*o*s. *U*, in Latin, sometimes goes into the still thinner sound of *i*: thus, *maxumus*, *caputis*, degenerated into *maximus*, *capitis*. Of the labial series of vowels (see LETTERS), *u* approaches nearest to the labial consonants—so much so that in Latin the vowel *u* and the consonant *v* were both denoted by the same character, *v*, of which *u* is only a later modification. In the middle ages the two characters were used indifferently whether as vowel or consonant; and it was not till the 16th c. that the Dutch scholars fixed the use of the character *u* for the vowel, as distinct from *v*.

UBEDA, *ō-vā'thâ:* town of Spain, Andalusia, in the modern province of Jaen; on an olive-clad slope in a cultivated plain, 26 m. n.e. of the town of Jaen. It contains some fine specimens of architecture, of which the chief is the cathedral. The industries are agriculture, and manufacture of porous vessels of red and white clay. U. was built by the Moors, and under them it is said to have contained 70,000 inhabitants.—Pop. (1887) 18,163.

UBIETY, n. *ū-bī'ĕ-tĭ* [mod. L. *ubietas*—from L. *ubi*, where]: in *philos.*, the presence of one thing with regard to another; the presence of a thing in place; state or condition of being in a place. According to the Schoolmen, ubiety might be: (1) Circumscriptive, as when all the parts of a

body are answerable to the parts of space in which it is, and exclude any other body. (2) Definitive, as when a human soul is limited in its presence to the same place as a human body. (3) Repletive, as when God is present through every portion of space. This last form is sometimes called Ubiquity.

UBIQUITOUS, a. *ū-bĭk'wĭ-tŭs* [F. *ubiquité*, ubiquity—from L. *ubīquĕ*, everywhere—from *ubi*, where]: existing or being everywhere; omnipresent. UBIQ'UITOUSLY, ad. *-lĭ*. UBIQ'UITARY, a. *-wĭ-tĕr-ĭ*, existing everywhere or in all places: N. one who exists everywhere. UBIQUITA'RIAN, n. *-tā'rĭ-ăn*, one who teaches or believes that Christ as man is omnipresent; a Ubiquist. UBIQ'UITY, n. *-wĭ-tĭ*, existence everywhere at the same time; omnipresence. UBIQUISTS, n. plu. *ū'bĭ-kwĭsts*, a Lutheran sect which arose about the middle of the sixteenth century, and which asserted the omnipresence of Christ's body, especially in the Eucharist.

UBI SUPRA, phrase, *ū'bī sū'prâ* [L., where above]: in the place or passage above mentioned; noting reference to some passage or page previously named or referred to.

UCAYALI, *ô-kī-â'lē*, RIVER: great river of Peru, one of the chief head-waters of the Amazon, which it joins from the s., in s. lat. 4° 40′ and w. long. 73° 30′, opposite the town of Nauta. It is the largest river that joins the Amazon above Brazilian territory, and has been regarded by some as the main stream of the Amazon; but at its mouth it is not more than half the width of the Amazon. Attention has been strongly directed to the U. as affording communication between w. Peru and the Atlantic. It was partially explored by Lieut. Herndon, of the U. S. navy, 1851, and more recently by a Peruvian expedition. It has been found navigable by steamers from its mouth to towns not far from Lima, 3,700 m. from the mouth of the Amazon. On a branch which comes from Cuzco, falls and rapids impede navigation more than 100 m. below Cuzco. The course of the U. is generally northward, and, including only its principal windings, its length is not less than 1,100 m. It receives many large branches. The name U. is not given to any of its head-waters, the chief of which is the Tambo, formed by junction of the Mantaro, rising n.w. of Lima, and the Apurimac, rising farther south.

UDAL, a. *ô'dăl* [Icel. *odal;* Dan. *odel*, a hereditary estate (see ALLODIUM)]: Allodial (q.v.), still applied in *Orkney* and *Shetland* to land held under no feudal superior (see ALLODIUM: ALLODIAL TENURE). UDALLER, n. *ô'dăl-lĕr*, or U'DALMAN, n. *-măn*, one who holds lands without any original charter and without a feudal superior. UDAL RIGHT, in the *law of Scotland*, that right in land which may be completed without charter and sasine by undisturbed possession provable by witnesses before an inquest.

UDALL, *yŏ'dal* (or WOOD'ALL), NICHOLAS: author: 1504–56; b. England. He was educated at Oxford, and became fellow of Corpus Christi College there; was master of Eton School 1534–43, but was dismissed because in his zeal as a reformer he had removed silver images from the chapel. Thereafter he was successively vicar of Braintree, rector of Calbern, canon of Windsor; the year before his death he became master of Westminster School. He wrote several comedies in Latin and English, for use in school exhibitions; also some poems and school-books.

UDDER, n. *ŭd'dĕr* [O.Dut. *uder;* Dan. *yver;* OHG. *utar;* Ger. *euter;* Icel. *jugr;* Gr. *outhar;* L. *uber*, an udder: Ir. and Gael. *uth*, an udder, a teat]: the milk-vessel of a female beast, with the dugs or paps, particularly in cows and other large quadrupeds. UD'DERED, a. *-dĕrd*, furnished with udders. UD'DERLESS, a. *-lĕs*, deprived of a mother's milk.

UDINE, *ō'dē-nā:* city of n. Italy, Venetia, in the province of U., formerly called also the province of Friuli; in a fertile plain, about 75 m. n.e. of Venice by railway. It is a walled town, 4 m. in circumference, with wide, handsome streets and squares. The castle, on a hill in the midst of the city, was formerly the residence of the patriarchs of Aquileia, and is now the seat of the tribunals. The Antonini Palace is a work of the architect Palladius. U. trades in silk, in copper utensils, and rosolio. There are leather, paper, and silk factories. Two m. from U. is the village of Campoformio, where, 1797, the treaty between Bonaparte and Austria was signed, by which Venice was ceded to the latter.—Pop. (1892) 36,000; (1901) 37,942.

UDOMETER, n. *ū-dŏm'ĕ-tĕr* [L. *udus*, moist, wet; Gr. *metron*, a measure]: a water-measure; a rain-gauge.

UEBERWEG, *ü'bĕr-vĕch*, FRIEDRICH: educator: 1826, Jan. 22—1871, June 7; b. Solingen, Prussia. He was educated in the universities of Göttingen and Berlin, was a tutor in the Univ. of Bonn 1852–62, and was prof. of philosophy in the Univ. of Königsberg from 1862 till his death. His publications include: *System der Logik und Geschichte der logischen Lehren* (Bonn 1857, transl. London 1871); *Grundriss der Geschichte der Philosophie von Thales bis auf die Gegenwart* (3 vols. Berlin 1862–66); and *History of Philosophy* (transl. 2 vols., New York and London 1874).

UFA, *ō'fâ:* government of s.e Russia: 47,112 sq. m.; formed 1865 out of the five n.w districts of Orenburg, and separated from the present govt. of Orenburg by the s w. branch of the Ural Mts. See ORENBURG.—Pop. (1882) 1,793,260; (1889) 2,018,356; (1897) 2,220,497.

UFA: city, cap. of the govt. of U.; on right bank of the Biëlaia, or White river; was founded 1574, in the reign of Ivan IV. It contains 12 churches and 24 manufactories. The principal articles of trade are honey, wax, fat, furs, and skins. The Biëlaia, affluent of the Kama, and thus connected with the Volga, is here navigable for large ships.—Pop. (1884) 25,660; (1897) 49,961.

UGANDA, *ū-gân'da:* protectorate, central Africa, n. of the Victoria Nyanza (q.v.), extending from 1° n. lat. to 5° n. lat., and from e. long. 31° to the e. boundary of Congo Free State, about 80,000 sq. m. At the shore of the lake and in n.w. the country is mountainous, with abundance of timber; further n. is a level region; the e. portion is undulating. The soil is generally a rich black alluvium, 2 to 3 ft. deep, underlaid by red sandy clay. Climate is mild, and the temperature equable. The people of the kingdom of U. are a tall and handsome race, and they are divided into four classes: slaves, peasants, chiefs, and 'bakungu,' or superior chiefs. The natives are warlike, and the military organization is strict. The fauna is rich in species, comprising elephants, buffaloes, zebras, rhinoceroses, hippopotami, wild boars, antelopes, lions, leopards; parrots, guinea-fowl, vultures, adjutants, eagles, flamingoes, ibises. The of this kingdom have domesticated cows, sheep, goats, and dogs. The banana is the staple food of the people: it requires little or no cultivation. The cultivated plants of U. are the sweet-potato, and, to some extent, sugar-cane, coffee, maize, cassava, sesame, millet, pumpkins. Europeans have introduced wheat, rice, guavas, papaws, pomegranates, tomatoes, onions. Wine is made from the banana-tree. The Waganda are skilled in pottery, basket-work, wood-work, boat-building, and bark-cloth weaving. They also practice tanning, dyeing, and bead-work. In numeration they use the decimal system. The grammar of their language is highly complex; and their vocabulary is very rich. They have great skill in music, and have clear and melodious voices: their musical instruments are harmonicons, rattles, drums, horns, whistles. About 1,700,000 natives speak Bantutu languages; the rest belong to the Masai, Nilotic and Sudanese groups. The first Europeans to visit U. were Speke and Grant, 1860. There are Prot. and Rom. Cath. mission stations in the country. Pop. estimated at 4,000,000. Fierce strife in U. in 1890, the so-called 'Christian' natives rising in arms to reinstate the deposed king Mwanga and to expel the actual king Karema (brother of Mwanga) and his heathen followers. With the material aid of the agent of the British and E. African Co. and of Dr. Peters, leader of a German expedition, the 'Christian' party triumphed, and restored to power Mwanga. But Karema, assisted by Arabs, after a few weeks regained his throne, and the missionaries and the E. African Co.'s agents were driven out of the country, taking refuge on an island in the lake. Again Karema was deposed, and his rival firmly established in power, while German and English agents were jealously watching each other's movements in the distracted kingdom. For his services in the restoration of Mwanga, Dr. Peters obtained 'valuable treaties and monopolies in favor of the Germans.' Until 1893 the Imperial Brit. E. Africa Co. administered the U. kingdom, but in that year withdrew, and a British protectorate was declared, with a royal commission subordinate to the British agent at Zanzibar at

its head. In 1896 the British parliament granted £3,000,000 for the construction of a railway from the island of Mombasa to U., a distance of 657 miles, and the first rail on the line was laid in May; a bridge was to connect Mombasa with the mainland.

The progress of 'civilization' in U. is remarkable. While only a few years ago race and creed wars of extermination were the order of the day, now peace reigns undisturbed, and the native police and the British garrison have little trouble in maintaining order everywhere. Christian churches have been established, and converts have been numerous. Good roads are being made, and towns are assuming a European air. The chiefs and notables live in two-story houses of brick or stone, with floors carpeted and the apartments furnished in European fashion. A burglar-proof safe adorns the office of the king's prime minister. The king himself (1896) ordered a brougham from England; several of his high officers sent for dog-carts, and scores of bicycles were arriving.

UGH, interj. *ŭ* or *ŭch* with guttural *ch:* an expression of disgust or horror usually emphasized by a shudder.

UGLITCH, *ôg-lētch':* one of the oldest towns of Great Russia, govt. of Jaroslav; on the right bank of the Volga, 488 m. s.e. of St. Petersburg. In early times it was the chief town of an independent principality. It is now again thriving.—Pop. (1883) 11,930.

UGLY, a. *ŭg'lĭ* [from the interjection *ugh*, expressing fear or horror: Icel. *ugga*, to fear, to doubt; *uggligr*, frightful, alarming: Goth. *ogan*, to fear: OE. *uglike* or *ugly*, used formerly in the sense of *horrible*]: displeasing to the eye; frightful; deformed; perverse of disposition; morally repulsive; *familiarly*, dangerous, as an *ugly* customer. UG'LINESS, n. *-nĕs*, total want of beauty; moral depravity. UG'LILY, ad. *-lĭ*.

UGOLINO DELLA GHERARDESCA, *ô-go-lē'no dèl'lâ gā-râr-dĕs'kâ*, Count: Italian nobleman of the 12th c., known chiefly for his cruel death, which Dante has made memorable in his *Inferno*. U. was for a time the head of the party of the Guelphs at Pisa; but a conspiracy, led by Abp. Ubaldini, a Ghibelline leader, was formed against him, and with his sons and grandsons he was cast into the tower of Gualandi, and left to perish miserably by starvation. See GHERARDESCA.

UGRIANS, *ū'grĭ-anz*, or U'GRIAN FINNS: a division of the Finnic race, comprising the Voguls, who extend from the Ural Mts. e. to near the Obi river, in Siberia, and s. as far as Tobolsk; the Ostyaks, from the Voguls e. to the Yenisei river, and from the Arctic circle to n. lat. 59°; and the Magyars of Hungary. Some ethnologists employ the term U. as a general one to designate Finns, Laps, Permians, Ostyaks, etc.; see FINNS: MONGOLS.

UGSOME, a. *ŭg'sŭm:* in *OE.* and *Scot.*, ugly. UG'SOMENESS, n. *-nĕs*, ugliness.

UHLAN, or ULAN, n., *ū'lăn* [F., a lancer—from Pol. *ulan;* Turk. *oglan*, a youth, a lad]: a light-cavalry soldier, wearing a semi-oriental uniform, armed with sabre, lance, and pistol, and employed chiefly in outpost duty, foraging, etc. Uhlans were introduced into n. Europe with the colonies of Tartars who established themselves in Poland and Lithuania. They were mounted on light active Tartar horses, and served mostly as 'irregulars.' Their lance was 5½ to 6½ ft. in length, and, like that of the modern 'lancers,' was attached to a stout leather thong or cord, which was fastened to the left shoulder, and passed round behind the back, so as to allow the lance to be couched under the right arm. Immediately below its point was attached a strip of gaudy-colored cloth, whose fluttering was intended to frighten the enemies' horses. The early dress was similar to that of the Turks, and the regiments, or *polks*, were distinguished from each other by their red, green, yellow, or blue uniforms. The Austrians and Prussians were the first to borrow this species of cavalry from the Poles. In 1734 an attempt was made by Marshal Saxe to introduce the Uhlans into France, and a 'polk' of

1,000 men were formed; but it was disbanded at Saxe's death. The Prussian Uhlans won great renown in the Franco-German war of 1870–1 by their bravery and marvellous activity. The Prussians applied the term loosely including all their light cavalry under the designation.

UHLAND, *ō lănt*, JOHANN LUDWIG: German poet; 1787, Apr. 26—1862, Nov. 13; b. Tübingen. He studied at the univ. of his native city. He began to publish ballads and other lyrics in various periodicals, the first collection of which, under the title *Gedichte*, appeared 1815. To this he continually added through his life, and on these *Gedichte* his fame rests. Their popularity has been, and continues to be, as great as it is merited: the 60th ed. was issued 1875. Other productions of U. are his admirable essays, *Ueber Walther von der Vogelweide* (Stuttg. 1822), and *Ueber den Mythus der nord. Sagenlehre vom Thor* (Stuttg. 1836); a masterly collection of old popular songs—*Alter hoch und niederdeutscher Volkslieder* (Stuttg. 1844–5); and two dramas, *Herzog Ernst von Schwaben* (Heidelb. 1817), and *Ludwig der Baier* (Berl. 1819). U. was a patriotic politician as well as a romantic poet. He entered the representative assembly of Würtemberg 1819 as deputy from Tübingen, and was an active member of the liberal party. He was also a delegate to the Frankfurt Assembly of 1848. He died at Tübingen. His pieces are full of spirit, imagination, and truth, finely picturesque in their sketches of nature and of character, and exquisite in their varied tones of feeling. Nothing, indeed, can surpass the brevity, vigor, and suggestive beauty of his ballads, in which a romantic sweetness of sentiment and a classic purity of style are happily combined. His poetry, in its delicate and noble tone, is a transcript of his personal character. U. is the acknowledged head of the 'Suabian School' of German poets. See Pfizer's *Uhland und Rückert* (Stuttg. 1837), and Mayer's *U.* (1867). Longfellow, in *Hyperion*, translated some of U.'s ballads into English; translations by Platt, Skeat, and Sanders also have appeared.

UIST, *wĭst*, NORTH and SOUTH: two islands of the Outer Hebrides; 15 to 18 m. w. of the Isle of Skye, from which they are separated by the Little Minch Their e. coasts are deeply indented, while the w. coasts are almost unbroken.—NORTH U., between which and *South U.* the island of Benbecula intervenes, is 18 m. long from w. to e., and 10 to 3 m. in breadth. The e. half is mostly a bog much cut up by lochs and watercourses. In the w. part, mostly hilly, there is a tract of uneven, low land, beautiful in certain seasons, and fertile. Pop. (1881) 3,371.—SOUTH U. is 20 m. long, 7 m. broad. The e. dist. is upland; the w. is alluvial and productive. The people almost all are Rom. Catholics. Pop. (1881) 3,825.

UITLANDER, *oyt'lăndĕr*, n. [Dutch *uitlander*, outsider]: in the S. African Republic, a foreigner, especially one of the Afrikander, British, American, or European pop. The U., though the chief property owner, wealth-producer, and taxpayer in the state, is denied any voice in the government. See SOUTH AFRICAN REPUBLIC.

UJEIN, or UJJAIN, or OOJEIN, *ô-jīn':* one of the seven sacred cities of Hindustan, in Sindia's dominions, of which it was formerly the famous cap.; on the right bank of the Sipra, 35 m. n n.w. of Indore. It is much decayed. U. is surrounded by walls with round towers, is six m. in circumference, contains the grand palace of the head of the Sindia family, several mosques and mausoleums, an observatory, and an antique gate.—Pop. (1881) 32,932.

UJHELY-SATORALYA, *ô'ē-hely'-sâ-tō-rol'yŏh:* market-town of Hungary, 105 m. n.w. of Pesth; noted for wine-culture.—Pop. (1880) 11,264.

UJIJI, *ô-jē'jē,* called also KAVELE: town in e. central Africa, on the e. shore of Lake Tanganyika; s. lat. 4° 55', e. long. 30° 5'. It is an emporium for ivory, and was formerly a great slave-market. The pop. is largely floating, and consists of Arabs and representatives of many central African tribes. The natives live in rude huts, the Arabs in houses of sun-dried bricks The climate is said to be unhealthful. Here Dr. Livingstone was found by Henry M. Stanley 1871, Oct. 28.

UKASE, n. *ū-kās'* [Russ. *ukas*—from *kasatj,* to show, to say]: in *Russia,* an order or edict emanating from the government and having the force of law. A *Ukase,* may proceed directly from the emperor, and is then called *imenny ukas;* or it is published as a decision of the directing senate. Both forms have the force of laws till annulled by subsequent decisions. Many ukases are issued during one reign; and as an immense chaos of ukases had accumulated since 1649 (the date of the last codification of laws), Czar Nicholas ordered (1827) that a collation of them should be made. The result was a collection of laws in 48 vols., supplemented year by year by volumes of new ukases, which, after elimination of such ukases as are unimportant or temporary, constitutes the present legal code (*svod*) of the Russian empire. The *prikases* are imperial 'orders for the day,' or military orders during a campaign.

UKRAINE, *ô-krān'* (Slav., a frontier country or March): name given in Poland first to the frontiers toward the Tartars and other nomads; afterward to the fertile regions on both sides of the middle Dnieper, without definite limits. The U. was long a bone of contention between Poland and Russia. About 1686 the part on the e. side of the Dnieper was ceded to Russia (Russian U.); and at the second partition of Poland, the w. portion (Polish U.) also fell to Russia, and is mostly comprised in the govt. of Kiev. The historic U. forms the greater part of what is called Little Russia (a name which appears first about 1654), which is made up of the governments of Kiev, Podolia, Poltava, and Kharkov.

ULANS: see UHLAN.

ULCER, n. *ŭl'sĕr* [F. *ulcère*—from L. *ulcus*, a sore; *ulcĕra*, sores: Sp. and It. *ulcera*]: a sore; a dangerous running sore originating in a constitutional disorder. UL'CERATE, v. *-āt*, to affect with ulcers; to be formed into an ulcer. UL'CERATING, imp. UL'CERATED, pp.: ADJ. affected with ulcers; having the character of an ulcer. UL'CERA'TION, n. *-ā'shŭn* [F. *ulcération*—L.]: the process of forming into an ulcer; an ulcer (see below). UL'CERATORY, a. *-ă-tĕr-ĭ*, that promotes ulceration. UL'CERED, a. *-sĕrd*, having become ulcerous; affected with an ulcer. UL'CEROUS, a. *-ŭs* [L. *ulcĕrōsus*, full of sores]: affected with an ulcer or with ulcers; of the nature of an ulcer; discharging pus or matter. UL'CEROUSLY, ad. *-lĭ*. UL'CEROUSNESS, n. *-nĕs*, the state of being ulcerous.—*Ulcers* may be classified according to the constitutional or specific disease from which they are derived, or according to the characters which they present. According to the first system, we speak of ulcers as healthy, inflammatory, strumous, etc.; while, according to the second, they are named irritable, chronic, sloughing, etc. In this article we adopt the former of these arrangements, as on the whole most satisfactory, though each has its advantages.

A *common, simple,* or *healthy ulcer* is such as is left after the separation of an accidental slough in a healthy person, and is merely a healthy granulating surface, tending to cicatrization. Its edges shelve gently down to the base, and are scarcely harder than the adjacent healthy skin. Its surface near the border is of purplish-blue tint where the young epidermis modifies the color of the healing granulations; and within this the granulations have a deeper hue than those at the centre, being most vascular where the cuticle is being chiefly developed. The discharge from such an ulcer is healthy or 'laudable' pus. The only treatment required is a little dry lint, if there is much discharge; or the water-dressing, if the sore is comparatively dry. When the granulations are too luxuriant, they must be touched with nitrate of silver, and dressed with dry lint. *Inflammatory ulcers* differ less than most kinds from the above-described common or healthy ulcers. They arise usually from some little injury, such as a blow or slight abrasion of the skin, which to a healthy person would have done no harm. Their most common seat is on the lower half of the leg or shin. The surface is red, and bleeds easily; the discharge is thin and watery; the edges irregular or shreddy; and the surrounding skin shows a red tinge, and is the seat of a hot and aching sensation. This ulcer occurs mostly in the infirm and old, the ill-fed and overworked. Hence constitutional treatment, good diet, and complete rest (with elevation of the limb) are demanded, in addition to water-dressing or lead-lotion applied warm. *Senile ulcers* usually present very little discharge, exhibit granulations of rusty-red tint, and are surrounded by a dusky-red area. Nourishing food, wine, bark, and the mineral acids are here required, and opium in small repeated doses is often serviceable. The local treatment must be stimulating; and, in bad cases,

strapping the leg daily with a mixture of resin ointment and Peruvian balsam, spread on strips of lint, has been recommended on high authority. *Strumous or scrofulous ulcers* occur usually as the consequence of scrofulous inflammation in the subcutaneous tissue or lymphatic glands. They are most frequent in the neck, groins, cheeks, scalp, and the neighborhood of the larger joints. The discharge is thin and of greenish-yellow tint. These ulcers are seldom very sensitive or painful. The general treatment must be that recommended for constitutional Scrofula (q.v.). Iodine, in some form or other, is the best local application. A poultice of bruised and warmed sea-weed is a very popular remedy; but there is probably nothing so efficacious as tincture of iodine diluted with water till it causes only a slight discomfort, and applied three or four times a day (about 30 drops of the tincture may be added to an ounce of water, to begin with).—Among many other species of ulcers distinguished by Sir J. Paget, are the *Varicose, Indolent,* and *Sloughing Ulcer. Varicose ulcers* are connected with an enlarged or varicose state of the veins of the lower extremity, which, by weakening the parts, renders them especially liable to ulceration: see VARICOSE VEINS. *Chronic, indolent,* or *callous ulcer,* is seated usually in the lower half of the leg, and is generally of oval form, with its long axis parallel to that of the leg. 'Its base lies deep, and is flat, pale, or tawny and dusky, with very minute or no visible granulations. The margin is usually abrupt, or unequally shelving, and in its most characteristic form strictly overlaid with opaque, white, dense epidermis.'—Many volumes have been written on the proper treatment for this form of ulcer. Sir J. Paget especially recommends opium, regulated pressure, and blistering. A grain of opium night and morning is usually sufficient. The pressure is applied with straps of adhesive or lead plaster on linen. The object of blistering is not only to stimulate the ulcer, but to soften its callous edges by causing absorption of part of the exudation with which they are infiltrated, and desquamation of the cuticle which covers them. The expediency of healing old ulcers of this kind has often been questioned; inasmuch as apoplexy, palsy, mania, and other serious diseases are said to have followed the healing of such ulcers. In the following cases it may be decided that a cure should not be attempted: (1) If the ulcer be affected by the gout, having regular attacks of pain, returning at stated periods, and similar to what the patient has experienced from gout in other parts. (2) If an ulcer habitually occur whenever the constitution is disordered. (3) If the patient be very infirm and old; for under these circumstances the removal of a habitual source of irritation, or the diversion of a habitual efflux of blood, may prove fatal, and especially as very old ulcers have been known to heal spontaneously a short time before death. (4) In the case of ulcers on the legs of stout women about the critical period of life, and showing tendency to discharge profusely as the menstrual discharge diminishes.—To coun-

teract the dangerous tendencies in cases of the above classes, the bowels should be freely purged during, and for some time after, the cure of an old ulcer; and any symptoms of congestion in the head should receive attention.

For treatment of *Sloughing Ulcers*, see SYPHILIS.

ULCERA'TION: 'that part or effect of an inflammatory process in which the materials of inflamed tissues liquefy or degenerate, are cast off in solution or very minute particles from free surfaces, or, more rarely, are absorbed from the substance of the body.'—Paget, on 'Ulcers.' Generally speaking, however, the name ulcer is not applied to any inflammatory result unless the substance of a tissue deeper than the epithelial is exposed; and when the cast-off particles are only epithelial, the result is termed desquamation, abrasion, or excoriation, though the process may be essentially the same. Ulceration is closely allied to gangrene, the two processes differing in degree rather than in kind. 'When the degenerate or dead substance is cast off in one or more portions visible to the naked eye, the process is usually called gangrene; when the portions are not so visible, or are quite dissolved, it is called ulceration.' The degenerate tissues are always suspended or dissolved in a liquid, termed the 'discharge,' or 'ichor,' which varies in appearance and properties according to the cause and characters of the ulcerative process. From some ulcers, e.g., the primary syphilitic, it is contagious; from many, it appears corrosive, exciting by its acridity inflammatory changes in the tissues with which it is in contact.

ULE, n. *ū lē:* an elastic gum, the produce of the ule-tree of Mexico; the caoutchouc-yielding trees, *Castillŏă elastĭca* and *C. Markhamĭāna.*

ULEABORG, *ō'lĭ-ō-borg:* seaport-town of Russian Finland, cap. of the govt. of U.; on the s. bank of the Ulea, on the e. shore and near the head of the Gulf of Bothnia. It was founded 1605, and the privileges of a port were granted to it 1715. In 1822 it suffered severely from fire. The harbor has of late years become so shallow that vessels are obliged to unload in the roadstead, four m. from the town. The people are engaged in the dock-yards, saw-mills, and breweries of the town. In 1854 an English flotilla burned the gov. property in the place.—Pop. (1900) 16,306.

ULEMA, n. *ûl'ĭ-ma* [Ar. *Ulema*, the wise or learned men—from *alima*, to know]: class of theological jurists in Turkey, or one of the class, who, as is the case in Mohammedan countries, derive their decisions from the Koran and its commentaries. The U. has many privileges: he pays no taxes, cannot be condemned to death or deprived of his property by any court of law. He can only—eventually—be deposed and banished. The ulemas have to recognize, besides their two immediate superiors (the *kadiasks* or *kadilesks*), only the mufti as their chief authority, while they are the superiors of all the Mollahs (q.v.) in the different provinces. The kadis form the lowest judicial class, and are subject to the mollahs in every respect.

U'LEX: see FURZE.

ULEXITE, n. *ū'lĕks-īt:* a fibrous mineral, snow-white in color, consisting of hydrous borate of lime and soda.

ULFILAS, *ŭl'fĭ-las* (*Ulphilas*, *Wulfilas* = little wolf): celebrated translator of the Bible into Gothic: prob. 311–381; b. among the Goths n. of the Danube; of Marcomannian parentage. Consecrated bishop 341, he was severely persecuted by his heathen compatriots; and sought refuge 348, with a great number of new Christian converts, in Lower Mœsia, at the foot of the Hæmus, where he remained 33 years, dispatching his disciples as missionaries to the trans-Danubian Goths. In 388 he went to Constantinople (whither he had gone once before to assist at a council of the Arian party 360); and died there soon afterward. He was one of the chief lights of Arianism (see ARIUS), in the interest of which he exerted himself with energy. His political influence was great among his Gothic countrymen; and the contemporaneous Greek historians, no less than those writing soon after his death, are unanimous in attributing to him the largest share in the religious and social development of the Gothic population. His greatest work, however—rendering his name famous for all ages—is his Gothic translation of the Bible, a work by which he contrived both to fix the Gothic language and to perpetuate Christianity among the Gothic people. Familiar with Latin, Greek, and Gothic, and accustomed to write in each of them, he undertook to render the whole Bible, except the two warlike books of Samuel and Kings—whose influence he feared for his easily inflammable people—into a language which till then had, as far as we know, never been used for any important literary composition. U. is thus the father of Teutonic literature. Till the 9th c., this sacred and national work accompanied the Goths in all their migrations. But from that period nothing was known of it beyond what was found stated in the ancient ecclesiastical accounts, until the end of the 16th c., when Arnold Mercator discovered in the Abbey of Werden the four Gospels of U. Thence the MS. found its way to Prague, where it remained till 1648, when the Swedes took it as a spoil to Upsal, where it still remains in the Univ. Library, under the name *Codex Argenteus*. In 1818 further remnants of the work—a great portion of the letters of St. Paul—were discovered by A. Mai and Castiglioni, on palimpsests, in a Lombardian monastery, which, added to a few minor fragments, bring the New Test. somewhat near completion. But hardly anything—except a few passages from Ezra and Nehemiah—has survived of the Old Test. The immense importance of this sole Gothic remnant for Teutonic philology cannot be overrated. It is principally through it that the wonderfully fine structure of Gothic—a Germanic dialect of surpassing wealth and purity—has become known.

ULLAGE, n. *ŭl'lāj* [OF. *eullage*, the act of filling up; *eullier*, to fill up to the eye or bung-hole—from *oeil*, eye—from L. *oculus*, eye: Wedgwood, however, derives *eullier* from Prov. *oliar*, to anoint with oil, to fill up a cask, and says that 'in the s. of France, when the flask is nearly full, they add a little *oil* to prevent evaporation, so that *to oil* the flask is equivalent to filling it to the brim']: among *gaugers*, what a cask wants of being full; properly, the quantity required to fill it up.

ULLMANN, *ûl'man*, KARL: theologian: 1796, Mar. 15—1865, Jan. 12; b. Epfenbach, Baden. He studied theol. at Heidelberg and Tübingen; was intimate with Hegel, Daub, Schleiermacher, and Neander; became prof. in Heidelberg Univ. 1821; and in association with Umbreit founded the quarterly review *Theologische Studien und Kritiken* 1828. In 1829–36 he was a prof. in Halle Univ.; 1836 returned to Heidelberg; 1853 became bp. of the state church in Baden; and 1856–60 was pres. of the supreme ecclesiastical council. His teachings and writings had in view a reconciliation between Christianity and modern culture.

ULLMANNITE, n *ŭl'măn-nīt* [after *Ullmann*, a Hessian chemist]: an ore of nickel and antimony, found chiefly in the copper mines of the Westerwald, of a bluish-gray color.

ULLOA, *ôl-yō'â*, FRANCISCO DE: maritime explorer: d. about 1540; b. Spain. He accompanied Cortes to Mexico, and showed great courage and capacity. On the return of Cortes from Spain, he placed U. in command of a ship and 2 caravels, with orders to explore the Pacific coast as far n. as possible. U. suffered shipwreck in the Gulf of California 1539, Aug.; but the following month pursued his exploration with the two caravels. He parted company 1540, Apr. 5, with those of his fellow-voyagers who were in one of the caravels: they reached Santiago in safety. No trustworthy tidings of U. were heard thereafter. The journal of his expedition, written by his clerk, Francisco Preciado, was preserved in the archives of Seville: it was translated into It. by Ramusio, and published in his *Viaggi;* and into Eng. by James Burney for his *History of the Discoveries in the South Sea.*

ULLSWATER, *ŭlz'waw-têr:* after Windermere, the largest of the English 'Lakes;' between the counties of Cumberland and Westmoreland, 10 m. e. of Keswick; length 9 m.; breadth 1 m. Its scenery has none of the soft beauty of Windermere, but is rugged and grand. One of the chief features of the landscape is the lofty mountain Helvellyn, rising from the s.w. extremity of the lake.

ULM, *ûlm:* second city of Würtemberg, imperial fortress of the first class; on the left bank of the Danube, at the foot of the Swabian Alps; 45 m. s.e. of Stuttgart, 63 m. n.w. of Munich; lat. 49° 54′ n., long. 8° 8′ e. Till the war in 1866, U. was a stronghold of the Germanic Confederation, garrisoned by troops of Würtemberg, Austria, and Bavaria. It was long one of the most important imperial free cities. U. stands at the junction of the Blau with the Danube, which here becomes navigable. Two bridges unite

the city with New Ulm, a village on the Bavarian side of the river. The streets are narrow, and the buildings old. The environs are flat. The cathedral, a Prot. church, is remarkable for architectural beauty, and is, next to the cathedral of Cologne, the largest church in Germany: it is 475 ft. in length, 165 in breadth, and 140 in height, the unfinished tower over the main entrance rising 320 ft. Its interior presents an aspect of massive dignity. The building was begun 1377, and finished 1494. There are good schools for the people, a gymnasium, high school, and trade school, a public library, an agricultural soc., and many charitable institutions. Leading industries are weaving linen, cotton, woolen, and mixed fabrics; bleaching; making paper, leather; beer-brewing; ship-building; book-printing; etc. U. is famed for ornamental pipe-bowls, and pastry called Ulmer bread. Around the city are extensive gardens, and asparagus especially is cultivated.

The Romans had a settlement at this important point. In the middle ages, at the height of its prosperity, it had a pop. of 60,000. In 1530 the city accepted the Reformation, and the majority of the people have since been Lutherans. In 1802 U. was attached to Bavaria, and became part of Würtemberg 1810.—Pop. (1871) 26,290; (1900) 42,982.

ULMACEÆ, *ŭl-mā'sē-ē:* natural order of exogenous plants, regarded by some botanists as a sub-order of *Urticaceæ.* They are trees or shrubs, having rough alternate leaves, each leaf with a pair of deciduous stipules. The flowers are small and in loose clusters. The perianth is small, membranous, bell-shaped, irregular; the stamens equal in number to the lobes of the perianth, and inserted into their base; the ovary superior. The fruit is 1–2-celled, nut-like, or compressed and winged. There are about 60 known species, natives of temperate parts of the n. hemisphere. See ELM: NETTLE-TREE: ZELKOUA.

ULMACEOUS, a. *ŭl-mā'shŭs* [L. *ulmus,* an elm]: pertaining to trees of the elm kind, ord. *Ulmăcĕæ* (q.v.). ULMIC ACID, *ŭl'mĭk ăs'ĭd,* a vegetable acid exuding spontaneously from the elm, chestnut, oak, etc.; a constituent vegetable mold. UL'MIN, n. *-mĭn,* a dark-brown substance which exudes from the bark of the elm and several other trees (see HUMUS). UL'MOUS, a. *-mŭs,* applied to those dark substances in which ulmin is found. UL'MUS, n. *-mŭs,* a genus of hardy deciduous trees, including the elms.

ULNA, n. *ŭl'nă* [L. *ulna;* Gr. *ōlĕnē,* the elbow, the arm: It. *ulna*]: in *anat.,* the larger of the two bones that form the forearm, or that portion between the wrist and elbow (see ARM). UL'NAR, a. *-nĕr,* pertaining to the ulna or elbow.

ULODENDRON, n. *ū'lō-dĕn'drŏn* [Gr. *oulē,* a scar; *dendron,* a tree]: genus of fossil plants, which occur chiefly in the roof-shales of the coal-measures, based on trunks or stems often of considerable size, which are covered with small rhomboidal scars, as in Lepidodendron, formed by the bases of leaves or scales; but they differ remarkably from that genus in having a double series of large oval or cir-

cular markings, arranged linearly on opposite sides of the trunk. These markings are variously interpreted as representing the cicatrices produced by the bases of cones, by branches, or by leaf-stalks. This genus is, like many of the coal-fossils, extremely enigmatical; and it is difficult to determine its position in the vegetable kingdom: it is probably an ally of Lepidodendron, and that is known to be a vascular cryptogam nearly related to Lycopodium. Seven species are known.

ULOTRICHOUS, a. *ū-lŏt'rĭk-ŭs:* having crisp curly hair.

ULPIANUS, *ŭl-pĭ-ā'nŭs*, Domitius: Roman jurist, of Tyrian extraction, in the early part of the 3d c.: date of birth unknown; d. 228. He appears to have held juridical offices during the reigns of Septimius Severus and Caracalla, of which he was deprived by Elagabalus; but on the accession of Alexander Severus (222), he became the principal adviser of that emperor, who appointed him *scriniorum magister* (keeper of the public records), a *consiliarius* (public assessor), and *præfectus annonæ* (superintendent of the corn-market). He held also, during the reign of Alexander Severus, the important post of prefect of the Prætorian Guards. He was murdered in the palace, in a riot. U. was a voluminous and a valuable writer, being judicious in criticism and lucid in arrangement. In the *Digest* of Justinian there are no fewer than 2,462 excerpts from him, many of considerable length, and altogether forming about a third of the *Digest*. Unfortunately, the originals have almost entirely perished. The principal were: *Ad Edictum* (83 books), *Ad Sabinum* (51 books), *Ad Leges Juliam et Papiam* (20 books). The so-called *Fragmenta* of U. (pub. at Paris by Tilius 1549) consist of 29 titles, whence they are called in the Vatican MS. *Tituli ex Corpore Ulpiani*. The best ed. is Böcking's (Bonn 1836).

ULRIC, *ŭl'rĭk*, St., Bishop of Augsburg: venerated as one of the Fathers of the German Church: about 890–970; b. Augsburg; son of a Count of Dillingen prominent in mediæval German history. He was educated in the Benedictine monastery of St. Gall (q.v.), in Switzerland; but appears to have been influenced chiefly by a remarkable female recluse, Wiborada, whose cell was in the vicinity of St. Gall. By her counsel he turned to the secular ministry, and received holy orders at Augsburg, where he became bp. 923. He bore an important part in the public affairs of the empire during the reign of Henry I. and his son Otho; and he was the guiding spirit of the several councils in Germany which in the 10th c. labored at the work of reform,—See the anc. *Vita S. Oudalrici Episcopi*, ed. by Mabillon, by the Bollandists, and recently by Dr Pertz.

ULRICI, *ŭl-rē'tsē*, HERMANN: German philosopher: 1806, Mar. 23—1884, Jan. 11; b. Pförten, in Lower Lusatia. He studied at Halle and Berlin, and, after a brief career as a lawyer, turned to literature and philosophy. In 1834 he was appointed prof. at Halle, where he remained till his death. His first work was his *Geschichte der Hellenischen Dichtkunst* (1835), followed by an ingenious essay on the dramatic art of Shakespeare (*Ueber Shakspeare's dramatische Kunst*, 1839; Eng. transl. 1846). Other works are his *Ueber Princip und Methode der Hegel'schen Philosophie* (1841); *Das Grundprincip der Philosophie* (1845–6); a *System der Logik* (1852); *Gott und die Natur* (1862; 2d ed. 1866), *Gott und der Mensch* (1866), in which U. develops a system of theistic philosophy, in opposition to materialism and in reaction from the anti-ethical pantheistic tendency of Hegelian idealism.

ULSTER, n. *ŭl'stĕr* [originally made in *Ulster*, a province of Ireland]: a convenient large loose overcoat, reaching to the feet, made of almost any material (originally of frieze), and worn by both sexes.

ULSTER, *ŭl'stĕr* (L. *Ultonia*): province of Ireland (q.v.), the most n. of the four provinces. It is divided into nine counties—Antrim, Armagh, Cavan, Donegal, Down, Fermanagh, Londonderry, Monaghan, and Tyrone (see these entries).

U., as a distinct territory, is of very ancient origin. It formed one of the five ancient divisions of Ireland, and was the seat of the Hy-Nialls or O'Neills, as well as of the lesser septs of O'Donnell, O'Cahan, O'Doherty, Maguire, MacMahon, etc. The n.e. portion, now co. Down, was early overrun by John de Courcy, later by Hugh de Lacy, and was the most permanent seat of English power in the north. The Antrim coast was occupied by a Celtic colony from Scotland and the Isles. In the n. and n.w. parts of the prov. the English made several attempts at a permanent settlement; their success, however, was merely nominal until the reigns of Elizabeth and of James I., when the Plantation of U. was effected, Londonderry (q.v.) being the chief seat of the colony. In U., the Celtic race, owing to the frequent and large infusions of a foreign element, is found in a much smaller proportion than in the three other provinces.—Pop. (1861) 1,910,108, of whom 963,687 were Rom. Catholics; (1871) 1,833,228, of whom 897,230 were Rom. Catholics; (1881) 1,739,542 (Protestants 907,014, Rom. C. 831,784); (1891) 1,617,877; (1901) 1,582,826.

UL'STER BADGE: distinguishing badge of the order of baronets in England—a sinister hand, erect, open, and couped at the wrist gules. It was the armorial ensign of the province of Ulster; and was assigned by James I. to the baronets in respect of the order having been intended for encouragement of plantations in that province.

UL'STER-CUS'TOM, n.: same as Tenant Right (q.v.).

UL'STER KING-AT-ARMS: chief heraldic officer of Ireland, appointed by the crown.—Such an official, called Ireland, existed in the time of Richard II.; but the office fell into abeyance; and the place was filled by appointment, as at present, by Edward VI., 1552. Ulster's officeis in Dublin Castle.—See KING-AT-ARMS.

ULTERIOR, a. *ŭl-tē'rĭ-ēr* [L. *ulterĭor*, further, on the further side: It. *ulteriore*]: more distant or remote; further; beyond something else either expressed or implied; in *geog.*, beyond the frontier.

ULTIMA, a. *ŭl'tĭ-mă* [L. *ultĭmus*, the furthest, the most distant]: most remote, furthest; final; last: N. in *gram.*, the last syllable of a word. UL'TIMATE, a. *-māt*, furthest; most remote; extreme; last of a series; conclusive: in *chem.*, that relates to absolute elements; the last into which a substance can be resolved; the opposite of *proximate*. UL'TIMATELY, ad. *-lĭ*. UL'TIMA'TUM, n. *-mā'tŭm*, the last offer; the final conditions or terms offered, as in diplomatic negotiations; the most favorable terms which a negotiator is prepared to offer, whose rejection will be considered as putting an end to negotiation; any definite final proposition; plu. UL'TIMA'TA, *-tă*, or UL'TIMA'TUMS, *-tŭmz*. ULTIMATE RATIO, in *math.*, that term of a ratio toward which a series tends, and which it does not pass. ULTIMA THULE (see THULE). ULTIMUS HÆRES, n. *ŭl'tĭ-mŭs hē'rēz* [L. *hærēs*, an heir]: the crown, as being the *last heir* to whom lands lapse through absence of proper heirs, or by forfeiture on account of their original owners.

ULTIMO: usually contracted into ULT.: see under CURT.

ULTRA, a. and prefix, *ŭl'tră* [L. *ultra*, beyond]: beyond; on the other side; extreme; disposed to go beyond what is natural or proper: N. one who is extreme or radical in his opinions. UL TRAISM, n. *-ĭzm*, the principles of those who advocate extreme measures. ULTRA, n., or UL'TRAIST, n. *-ĭst*, one who advocates extreme measures.

ULTRAMARINE, a. *ŭl'tră-mă-rēn'* [L. *ultra*, beyond; *mărīnus*, marine—from *mărĕ*, the sea]: situated beyond the sea; foreign: N. a blue pigment of great beauty and permanence, prepared from the *lapis lazuli*, the finest specimens being brought from China and Further Asia—hence the name—now artificially prepared. The true U., from its costly nature, was used only by artists; the artificial U. is extensively used by house and ship painters, and is as cheap as it is beautiful. Many artists still insist upon having the true U., which is prepared as follows: fine lapis lazuli is broken into very small pieces, so as to enable the operator to see and pick out the small white portions which occur in it. Of the pieces of pure blue which remain, a pound-weight is then taken, and in a carefully covered crucible is heated to redness, and then thrown into cold water. It is next reduced to an impalpable powder, and mixed with six ounces of finely powdered resin, as light in color as it can be obtained, and two ounces each of spirits of turpentine, bees-wax, and linseed-oil, all previously melted together. When these ingredi-

ents are thoroughly worked into a mass, portions of it are taken and kneaded in clean water; as long as any blue color is given out, this is continued, until every portion has been so treated. The blue water is then allowed to rest, and the sediment is collected and washed in water several times. The first washing removes a considerable quantity of dirt and other foreign matters, and is consequently rejected. The second, after being well agitated, is decanted; and from it is obtained the highest quality of the pigment. That which remains usually has two other washings, each of which gives a product of a less value than the operation which preceded it. The product obtained by sediment from each of the waters used is carefully dried, and is then employed either to make cakes for water-color painting, or a mixture for oil-painting, the value being about $5 per ounce.—ARTIFICIAL ULTRAMARINE.—The French chemists Clement and Desormes, in studying the curious process of obtaining U. from lapis lazuli by mixing it with resin, etc., were led to an analysis of the coloring matter that suggested to Guimet the idea of composing it artificially. In this he succeeded, and obtained for his discovery the prize of 6,000 francs offered by the *Société d'Encouragement des Arts.* Almost simultaneously, Gmelin in Tübingen gave an analysis and a synthetic process which also succeeded, and artificial U. is now a regular article of manufacture. Chemical skill, however, is necessary to success, and the manufacturers' formulas are very various—differing in the quantities of the ingredients, and the order of mixing them. The German manufacturers are very successful, and some of them have recently produced a fine green U.—The following formula is one of the simplest: 100 parts of finely washed kaolin or porcelain-clay (hydrated silicate of aluminium), 100 of carbonate of sodium, 60 of sulphur, and 12 of charcoal, are mixed, and exposed in a covered crucible to a bright heat for 3½ hours, when a green, unfused residue should be left. This residue, after being well washed and dried, must be mixed with a fifth of its weight of sulphur, and exposed in a thin layer to a gentle heat, so as just to burn off the sulphur. When this is accomplished, more sulphur must be added, and the washing repeated; and so on until the mass acquires a light-blue color, which is usually after the third roasting. In 1872 Fürstenau introduced improvements into the manufacture of U., showing how the blue tint could be produced in one calcination. There is reason to believe, from the experiments of Wilkens, that U. is composed of two portions—one of which is constant in its composition, and is the essential coloring matter, containing about 40 parts of silicic acid, 26 of aluminium, 13 of sulphur, and 21 of sodium, arranged as a mixture of two silicates of aluminium, sodium sulphite, and sodium sulphide—the blue coloring principle being a compound of the latter two; while the other portion differs from the former in resisting the action of hydrochloric acid, and contains a variable amount of sand, clay, oxide of iron, and sulphuric acid. U., if heated in the air, gradually

assumes a dull-green tint; and it is quickly decomposed by the action of the mineral acids and chlorine.

The term *Yellow Ultramarine* is sometimes given commercially to chromate of baryta, a yellow insoluble powder used as a pigment. ULTRAMARINE ASHES, the residue of lapis lazuli from which ultramarine has been extracted, producing a color varying from a dull gray to blue.

ULTRAMONTANE, a. *ŭl'trā-mŏn'tān* [L. *ultra*, beyond, *montānus*, pertaining to a mountain—from *mons* or *montem;* a mountain: F. *ultramontain:* It. *oltramontano*]: beyond the mountains—namely, the Alps—meaning their south side when used by the nations north of them: belonging to the Italian or extreme party in the Chh. of Rome, who hold that the pope is superior to general councils, and independent of their decrees; that he is considered to be the source of all jurisdiction in the church; consequently that it is through him, and not directly in virtue of their episcopal office, that the bishops derive their powers of 'jurisdiction,' as distinguished from those of 'order'—opposed to *Gallican* (see ORDERS: EPISCOPAL SYSTEM: GALLICAN CHURCH): N. a person who holds ultramontane opinions. UL'TRAMON'TANISM, n. *-tān-izm*, the doctrines and tenets of those who hold extreme views as to the pope's rights and supremacy; the usurpation on the part of the church of rights and prerogatives proper to the state, the claim for the church and its ministers of a recognized right of interference in political, social, and worldly matters. UL'TRAMON'TANIST, n. *-tān-ĭst*, one who holds to ultramontanism.

ULTRAMUNDANE, a. *ŭl'trā-mŭn'dān* [L. *ultra*, beyond; *mundus*, the world]: beyond the world or the limits of our system.

UL'TRA-RED, a.: term applied to the rays beyond the red or low end of the spectrum. From these rays, invisible on account of the slowness of their vibrations, the greatest heating effects are obtained: see SPECTRUM.

UL'TRA-VI'OLET, a.: term applied to the rays beyond the violet or high end of the spectrum. The vibration of these rays is too rapid for vision, but they possess greater chemical activity than any others: see SPECTRUM.

ULTRA VIRES, *ŭl'trâ vī'rēz* [L., beyond powers]: in the law of corporations, a phrase meaning beyond the scope of a corporation's legal powers as defined by act of incorporation or by charter. Acts of a corporation that are U. V. are void in law; but should the corporation have received money or other value in consideration of the performance of an act U. V., the said money or value is recoverable in an appropriate action at law. A corporation may suffer deprivation of its charter by judgment of a court, as penalty for committing acts U. V. The general rule of law on the subject, as laid down by an authoritative writer, is that a corporation may lawfully engage in transactions expressly or impliedly authorized by its charter, read in a liberal sense; beyond these powers a corporation cannot legally or validly go.

ULTRONEOUS, a. *ŭl-trō'nē-ŭs* [L. *ultrōnĕus*, voluntary —from *ultro*, voluntarily]: of one's own accord; voluntary. ULTRO'NEOUSLY, ad. *-lĭ*.

ULUGH-BEG, *ō'lûg-bĕg*, MIRZA MOHAMMED BEN SHAH ROK, Prince of Samarkand: 1394–1449 (ruled 1447–49); grandson of Timûr (q.v.). He governed Western Turkestan as regent for his father, Shah Rokh, and succeeded to the throne on his father's death. Unfortunately, he was influenced by astrological indications to suspect the loyalty of his eldest son; and the injured prince rebelled, defeated and captured his father, and put him to death, thus fulfilling the prediction. U. is known to posterity as the founder of the observatory at Samarkand, as a patron of astronomers, and as himself a diligent observer. The astronomical tables which bear his name, compiled probably by himself and two assistants, have high reputation for accuracy, considering the time when they were compiled. The astronomical works of U. were in Arabic, afterward transl. into Persian, and thence the chronological portion of them rendered into Latin (Lond. 1650), by Greaves, who followed with a Latin version of the geographical part 1652. An ed. of U.'s catalogue of stars is in *Memoirs of the Royal Astronomical Society*, XIII.

ULULATE, v. *ŭl'ū lāt* [L. *ululātus*, a howling; *ululo*, I howl]: to howl, as a dog or wolf. UL'ULATING, imp UL'ULATED, pp. UL'ULA'TION, n. *-lā'shŭn*, a howl, as of a dog. A sound resembling such howling or barking has sometimes been uttered by human beings in a morbid mental state; the act is automatic, and is one of the modifications of hysteria.

UL'VA: see LAVER.

ULVERSTON, *ŭl'vĕr-ston:* small but important market-town and seaport of Lancashire, England; 22 m. by railway n.w. of Lancaster; in an extensive agricultural and mining district. It is the centre of commerce for Furness, and for parts of Cumberland and Westmoreland. It contains cotton and paper mills; manufactures linen, ropes, and woolen yarn; and has coasting-trade in iron and copper ores, limestones, grain, and gunpowder.—Pop. (1871) 7,607; (1881) 10,008; (1891) 9,948.

ULYSSES, *ū-lĭs'sēz:* Latin name of one of the heroes of the Trojan war, called Odysseus ('The Angry') in the poems of Homer. Different accounts are given of his parentage; but according to the oldest legend, the Homeric, he was son of Laertes, Prince of Ithaca (one of the Ionian Isles), and of Anticleia, daughter of Autolycus. According to a later legend, his father was the crafty Sisyphus; whence U. is called sometimes, by way of reproach, Sisyphides. He married Penelope (q v.), by whom he became father of Telemachus. While a youth, he acquired reputation for courage, eloquence, and address. When the expedition against Troy (see TROY) was resolved on, Agamemnon visited Ithaca, and prevailed on U., though with difficulty, to take part in it. Later traditions,

or perhaps rather *inventions*, exaggerate his reluctance to leave his home; and represent him as feigning madness—an artifice which did not succeed. Before hostilities broke out, U., with Menelaus and Palamedes, was sent to Troy, to persuade the Trojans to give up Helen and her treasures; but diplomacy having failed, the Greek princes assembled their fleets in the port of Aulis, and sailed for Troy, U. bringing 12 ships. During the siege, U. performed important services for the Greeks. In prudence, ingenuity of resource, and *finesse*, he was foremost of the Hellenic chiefs, while in courage he was inferior to none. After the fall of Troy, the most interesting part of U.'s career begins, and forms the subject of the Homeric poem called the *Odyssey*. Several of his adventures are manifestly of eastern origin, and closely resemble those of *Sindbad the Sailor*. Setting sail for home, his ships were driven by a storm on the coast of Thrace, where he plundered the town of Ismarus, but lost a number of his crew. Having re-embarked, a north wind blew them across the Ægean and the Levant, to the country of the Lotophagi (the 'Lotus-eaters'), on the coasts of Libya, where the companions of U. ate of the wondrous fruit, and wished to rest forever. (Tennyson has a delicious rendering of this episode.) But their leader compelled them to leave the land 'in which it alway seemeth afternoon;' and sailing north again, they touched at the 'island of goats,' where U. left all his ships but one. Thence he proceeded westward, till he reached the 'island of the Cyclopes' (Sicily), where occurred the incident narrated under POLYPHEMUS (q.v.). The island of Æolus, and the city of the Læstrygones (a race of cannibals), whither fortune and the winds next carried the Hellenic chief, are supposed to be only names for particular parts of Sicily. Thence he sailed westward to the island of Ææa, inhabited by the sorceress Circe (q.v.). After a year's sojourn he departed, and, sailing still further west, crossed Oceanus, the 'ocean-stream,' into the country of the Cimmerians (q.v.), where darkness reigns perpetually. Here (following the advice of Circe) he descended into Hades (q.v.), and inquired of the blind seer Teiresias how he might return to his native land. Teiresias disclosed to U. the fact of the implacable enmity of Poseidon (Neptune), on account of his having blinded Polyphemus (who was a son of Poseidon by the nymph Thoosa); but encouraged him with the assurance that he would yet reach Ithaca in safety, if he would not meddle with the herds of Helios (the sun-god) in Thrinacia. U. now retraced his course, and once more visited Circe, the kindly sorceress, who forewarned him of the dangers he would yet have to encounter, and how to act. A west wind blew them past the perilous island of the Sirens (q.v.), to the coasts of Italy. In passing between Scylla and Charybdis, the monster that inhabited the first of these rocks devoured six of U.'s companions. He next came to Thrinacia, which he would fain have passed by; but his crew insisted on landing, and, in spite of their oath, killed some of the cattle of Helios while U. was asleep. The

anger of Zeus was kindled. When they had sailed away, a fierce storm arose, and Zeus sent forth a flash of lightning that destroyed the ship. Every one on board was drowned except U. himself, who, after many dangers, reached the island of Ogygia, the abode of the nymph Calypso, with whom he lived eight years. After his departure (which was commanded by Zeus, who had promised to Athene that U. should one day see Ithaca again—the poet always represents him as having a longing after his native isle), Poseidon persecuted him with a storm, and cast him on the shores of Scheria, the island of the Phæacians, in most forlorn condition. He was, however, kindly received by Nausicaa, daughter of King Alcinous; and having revealed his name at a feast, the monarch provided him with a ship to carry him home. U. was asleep when the vessel approached the coast of Ithaca; and the Phæacian sailors who had accompanied him bore the unconscious hero to the shore and left him there. When he awoke, he did not at first recognize where he was; but Athene, appearing, informed him, and of all that had happened to Penelope (q.v.) in his absence. Disguised as a beggar, he repaired to his own court, where he was recognized by his nurse, and, as Homer touchingly describes, by his old dog, Argus. Aided by Telemachus and the swine-herd Eumæus, he took vengeance on the insolent suitors of his wife, all of whom he slew. Homer records nothing more of U.'s history; but he makes Teiresias prophesy, in the 11th book, that the hero would meet a painless death in a happy old age. Another tradition says that he was slain by Telegonus, who was his son by Circe. Later poets, e.g., Virgil and Ovid, represent U. as a much less noble and valiant character than he appears in Homer; his wisdom and subtlety are changed into cunning and deceit; and instead of heroic courage he displays the spirit of a coward.

UM: Kafir or Zulu word signifying river, used as prefix in the names of most of the rivers on the s.e. coast of Africa, from the Great Kei, where the names of Hottentot origin appear to cease, as far to the n.e. as the Sofala coast, where the names Imhambane, Imhampoora, have the same prefix in a corrupted shape. Among the principal rivers on this coast bearing this prefix are the Umgazi, Umbashee, Umtata, Umzimvoobo, and Umzimculu, draining Independent Kaffraria; the Umcomanzi and Umtugela in the colony of Natal; and the Umfolusi, Umhlatoozi, and Umapoota, between Natal and Delagoa Bay. The Hottentot word Kei has the same meaning, and is still preserved in the Kei and Keiskamma rivers, the Keriega, Keisuga, and other streams on the e. coast of the Cape Colony.

UMÂ, *ô'mâ:* in the epic and Purânic mythology of India (see INDIA—*Religion*), one of the principal names of the consort of the god S'iva. Other names by which she is also usually designated are *Durgâ*, *Devî*, *Kâlî*, *Pârvatî*, *Bhavânî*, and there are many others less frequent. As a consort of S'iva (q.v.), her name seems to have a double

reference: in the earlier Vedic writings (see VEDA: UPANISHAD) it typifies the Brahma-science, or the knowledge of what is the nature of Brahman, the Supreme Soul; in the later mythology it appears as the type of destruction—the female energy of S'iva (see S'ÂKTAS). Though this double character of the consort of S'iva is not always discernible in the myths connected with her special designations, and though at a late period the popular creed viewed her far more as the type of destruction than as that of divine wisdom, yet the great books that treat of her extol her as also the personifieation of the highest knowledge. Thus, in the *Devîmâhâtmya* she is invoked thus: 'O Devî, thou art the seed of the universe, the highest Mâyâ (q.v.); all this world is bewildered, but, descending on earth, thou art the cause of its final liberation: all the sciences are merely different modes of thyself.' She is invoked similarly in the *Mahâbhârata* (q.v.); and in the *Harivans'a* Vishn'u addresses her as Saraswatî, goddess of eloquence and of sciences, etc.

The myths relating to this goddess, who is worshipped in various parts of India—particularly in Bengal (see S'ÂKTAS)—are in the great epic poems and Purân'as, in poetical works, such as the *Kumârasambhava* (see KÂLIDÂSA), and in modern popular compositions; but the textbook of her worshippers is the *Devîmâhâtmya*, or 'the majesty of Devî'—considered of especial holiness. In the *Râmâyan'a* (q.v.), she is spoken of as the daughter of Mount Himâlaya, and the sister of the Ganges. The myths recounting her amazing exploits, in the destruetion of demons, are complex and innumerable (see VISHN'U: PURÂN'A: KÂRTTIKEYA: KANSA: ETC.). Annual festivals in various parts of India commemorate some of her victories. The worship of her as *Kâlî* (i.e the Black), to which the narrative (of her vietory over the demons Chan'd'a and Mun'd'a) has given rise, is considered by the Hindus themselves as embodying the principle of *tamas*, or darkness. She is represented as delighting in the slaughter of her foes, though capable of kindlier feelings to her friends. She is, however, styled the Blaek Goddess of Terror. frequenting cemeteries, and presiding over terrible sprites, fond of bloody saerifices; and her worship taking place in the darkest night of the month (see THUG). With S'iva, she resides on Mount *Kailâsa*, the northern peak of the Himâlaya, or in her own palace on the Vindhya Mountains, where she amuses herself with hunting. See Moor's *Hindu Pantheon*, where notices of festivals and descriptions of images of this goddess are given.—For the myths relating to her, see John Muir's work, *Original Sanskrit Texts*, vol. IV. (Lond. 1863); the *Harivans'a*, transl. by A. Langlois (Paris 1834-5); and the *Mârkan'd'eya Purân'a*, in *Bibliotheca Indica*, ed., with elaborate Preface, by the Rev. K. M. Banerjea (Calcutta 1862).

UMAN, *ô-mân':* town of Russia, govt. of Kiev; 120 m. s. of the town of Kiev, on the Umanka. It is inclosed by earthen ramparts.—Pop. (1880) 15,393; (1885) 15.976.

UMBAGOG, *ŭm'ba-gŏg*, LAKE: picturesque body of water in Oxford co., Me., and in Coos co., N. H., chiefly in the town of Errol, N. H.; 15 m. long, 1 m. to 10 m. wide, with outlet on the w. side into the Androscoggin river. It is reached by the Grand Trunk railroad from Gorham, N. H., and is widely known for its wild scenery and its abundance of fine trout.

UMBALLA, *ŭm-bâl'la*, or AMBALA, *âm-bâ'la:* walled town, cap. of the dist. of U., in the division of U., India; in the Punjab, 120 m. n.n.w. of Delhi. Under the walls of the fort are the British cantonments. Pop. (1881) of city 67,463; (1891) 79,270. Pop. of *division* 1,729,043.

UMBEL, n. *ŭm'bĕl* [L. *umbella*, a sunshade, a parasol—from *umbra*, a shadow: It. *umbella:* F. *ombelle*]: in *bot.*, an inflorescence in which numerous stalked flowers arise from one point, as in the carrot or hemlock (see UMBELLIFERÆ). UM'BELLAR, a. *-lĕr*, pertaining to or resembling an umbel. UM'BELLATE, a. *-āt*, or UM'BELLATED, a. bearing umbels; arranged in umbels; in *zool.*, having a number of nearly equal radii, all proceeding from a common centre. UM'BELLULE, n. *-lūl*, or UM'BELLET, n. *-lĕt*, a little or partial umbel. UM'BELLIF'EROUS, a. *-lĭf'ĕr-ŭs* [L. *fero*, I carry]: producing umbels; pertaining to the order of plants which have their flowers arranged in umbels. UMBELLIFER, n. *ŭm-bĕl'lĭ-fĕr*, plant of the order UM'BELLIF'ERÆ, *-lĭf ĕr-ē*.

UMBELLIFERÆ, *ŭm-bĕl-lĭf'ĕr-ē:* large and important nat. order of exogenous plants (the *Apiaceæ* of Lindley), containing more than 1,000 species, chiefly of the temperate regions of the n. hemisphere. The inflorescence of most plants of this order is peculiarly regular—a number of stalks, radiating from a common centre at the top of the stem or of a branch, each of which bears a flower at its extremity, thus forming an *Umbel* (q.v.). The umbel is often compound, the primary stalks dividing in a radiated manner, and forming *secondary umbels* or *umbellules*. The flowers are generally small, white, rarely yellow, still more rarely red, though frequently tinged with pink at the edges; have a 5-toothed calyx, often obsolete, or nearly so; a corolla of five petals, inserted in the top of the calyx, and alternating with its teeth; five stamens, an inferior germen, and two styles. The fruit is peculiar, and consists of two one-seeded, unopening carpels, rarely fleshy, touching one another on the inner side, and there attached to a little column (the *carpophore*), their common axis. Each carpel has five primary and four secondary longitudinal ridges, more or less distinct; and beneath the separating furrows there are often linear receptacles of essential oil, called *vittæ*. The U. are mostly herbaceous plants, rarely shrubby, with divided or compound, rarely simple, leaves. They generally abound in a resinous secretion, and a volatile oil, from which many of them derive poisonous and medicinal properties, more or less common to all parts of the plant, and often highly developed in the seeds. Acridity is their general characteristic. Some are pleasantly aromatic, others have a powerful and disagreeable smell. In the roots of some, especially when en-

larged by cultivation, starch and sugar are secreted, so that they become useful for food, though the peculiar flavor of the essential oil is still retained. The systematic arrangement of the U. has been found difficult by botanists. Sprengel, De Candolle, Koch, and others, have devoted much attention to this order. Of esculent-rooted U., the carrot and parsnip are the best-known examples. Skirret, earth-nut, and arracacha are also of some value. The roots of *Anesorhiza Capensis* and *Fœniculum Capense* are used at the Cape of Good Hope as esculents. The roots of *Chærophyllum tuberosum*, or SHAM, are used in the Himalaya. The herbage of *Prangos pabularia* is so bland that it is much used in the temperate parts of the E. Indies for feeding cattle, and is made into hay for winter fodder. It is said, however, to be injurious to horses, though oxen and sheep are rapidly fattened by it. The blanched stems of celery, enlarged by cultivation, are a favorite salad, and those of Alexanders (*Smyrnium olusatrum*) were formerly used in the same way. The candied stalks of eryngo were once much esteemed, and those of angelica are still used. The leaves of parsley, chervil, fennel, etc., are used for flavoring. Lovage (*Levisticum officinale*) is sometimes cultivated as a salad plant. The seeds of anise, caraway, coriander, etc., are used as carminatives. Hemlock, water-hemlock, water parsnip, fool's parsley, and many others are narcotic poisons—asafetida, galbanum, sagapenum, and opopanax are medicinal products of plants of this order.

UMBER, n. *ŭm'bĕr* [L. *umbra*, shade, hue; or from *Umbrĭa*, a district of Italy whence said to have been first obtained]: a pigment of various shades of brown, occurring either naturally in veins and beds, or prepared artificially. Mineral umber is a variety of the iron ore called Hæmatite (q.v.); consists chiefly of oxide of iron, with some oxide of manganese, silica, alumina, and water; is soft and earthy, of a dark-brown color, has a conchoidal fracture, readily imbibes water, and falls to pieces like newly-burnt lime. When gently heated, so as to drive off the water of hydration, it is known as Raw Umber. When roasted, it becomes reddish brown in color, called Burnt Umber, and in that state is also used as a valuable color in house-painting, and in both oil and water-color pictures. It probably came originally from Umbria, in Italy, but is now found in Cyprus. The name *umber* is also applied (1) to a finely pulverized peat or brown-coal from Cologne, used as a pigment, but chiefly employed to adulterate snuff, etc.; (2) to the grayling, a fish of the Salmon family; and (3) to an African bird (*Scopus umbretta*), of the family *Ardeidæ*, allied to the storks, but having a compressed bill with sharp ridge, the tip of the upper mandible hooked, and the nostrils situated in a furrow which extends the whole length of the bill. It is about the size of a crow, with umber-colored plumage, and the male has a large crest on the back of the head. UMBER, v. to darken with umber. UM'BERING, imp. UM'BERED, pp *-bĕrd:* ADJ. darkened as with umber. UM'BERY, a. *-bĕr-ĭ*, brown like umber.

UMBILICAL, a. *ŭm-bĭl'ĭ-kăl* or *ŭm'bĭl-ī'kăl*, or UMBIL'IC, a. *-ĭk* [L. *umbĭlīcus*, akin to Gr. *omphălos*, the navel]: of or pertaining to the navel; of the shape of the navel. UMBIL'ICAL CORD, in *anat.*, a cord-like substance which extends from the placenta to the navel of the fetus. UMBIL'ICATE, a. *-ĭ-kāt*, or UMBIL'ICATED, a. [L. *umbĭlīcātus*, navel-shaped]: having a navel, or resembling one; in *bot.*, fixed to a stalk by a point in the centre; depressed in the middle like a navel. UMBILICUS, n. *ŭm'bĭl-ī'kŭs*, the central spot of the abdomen, marked by a depression; the navel; in *bot.*, the scar by which a seed is attached to the placenta, more commonly called the hilum: in *conch.*, the conical depression at the base of a univalve shell.

UMBIL'ICAL CORD: the navel-string or bond of communication between the fetus (which it enters at the umbilicus, or navel) and the placenta, which is attached to the inner surface of the maternal womb. It consists of the umbilical vein lying in the centre, and the two umbilical arteries winding from left to right round the vein. Contrary to the usual course, the vein conveys arterial blood to the fetus, and the arteries return venous blood to the placenta. These vessels are imbedded in a yellow gelatinous matter, known from its first describer (1659) as Wharton's gelatine. Nervous filaments have been traced into the cord; but the presence of lymphatics is doubtful. The whole is invested by a membrane (the Amnion—q.v.), and its ordinary length is about 20 in. As soon as a child is born, and its respiration fairly established, the umbilical cord is tied, and divided near the navel, which spontaneously closes, the fragment of attached cord dying away. See FŒTUS: PLACENTA.

UMBIL'ICAL CORD, in Botany: connecting link between the placenta of the ovary and the ovule, through which pass the vessels which nourish the ovule till it ripens into the seed. In some plants the ovules are so closely connected with the placenta that no U. C. can be said to exist: in others it is of considerable length.

UMBIL'ICAL HER'NIA: protrusion of intestine at the navel; most common shortly after birth; but sometimes in women who have been frequently pregnant. If reducible, and the patient an infant, the ordinary treatment is to place the convex surface of an ivory hemisphere on the navel, and to retain it with strips of adhesive plaster or a bandage. Hernia in an infant, with or without treatment, is usually recovered from. In an adult, the ideal treatment, as for all hernias, is a radical surgical operation, the relaxed abdominal wall being sewed so that recurrence is unlikely. A bandage should, however, be worn for weeks or months. Operation becomes especially desirable when the hernia is irreducible, and imperative if the bowel is strangulated. If operation is not advisable on account of cardiac or other disease, and the hernia is not strangulated, a truss may be worn.

UMBLES, n. plu. *ŭm'blz* [L. *umbĭlīcus*, the navel (see NUMBLES)]: the entrails of a deer. UMBLE-PIE: see under HUMBLES.

UMBO, n. *ŭm'bō* [L. *umbo*, the boss of a shield]: the boss or protuberant part of a shield: in *bot.*, a conical protuberance on a surface: in *conch.*, the knob-like point of a bivalve shell, situated immediately above the hinge. UMBONES, n. plu. *ŭm'bō-nēz.* UM'BONATE, a. *-nāt*, or UM'BONATED, a. *-nā-tĕd*, knobbed in the centre; round, with a projecting point in the centre like the boss of an anc. shield. UMBONULATE, a. *ŭm-bŏn'ū-lāt*, in *bot.*, having a termination like a small boss.

UMBRA, n. *ŭm'brā* [L. *umbra*, a shadow]: in *astron.*, the dark cone projected from a planet or satellite on the side opposite the sun.

UMBRAGE, n. *ŭm'brāj* [F. *ombrage*, a shade, jealousy, suspicion—from L. *umbraticus*, pertaining to shade or retirement—from *umbra*, a shade, a shadow]: shade or a shade; a screen of trees or foliage; hence, a feeling of being overshadowed; notion or suspicion of injury; offense. UMBRAGEOUS, a. *ŭm-brā'jŭs*, forming or yielding shade; shady; in *OE.*, suspicious; feeling umbrage. UMBRA'GEOUSNESS, n. *-nĕs*, the state or quality of being umbrageous.

UMBRAL, a. *ŭm'bral* [L. *umbra*]: in *geol.*, shady; term applied by Prof. H. D. Rogers to the 14th series of the Appalachian strata, corresponding in period to the Carboniferous limestone of Europe; maximum thickness in Penn. and Va., about 3,000 ft.; in the western states, about 1,000 feet.

UMBRELLA, n. *ŭm-brĕl'lă* [It. *ombrella*, an umbrella—from It. *ombra;* L. *umbra*, a shade: F. *ombrelle*, a sunshade]: a portable screen to be held above the head to shade from the sun, or to protect from rain, and which may be opened and shut at pleasure.—The *Umbrella* is of great antiquity. In the sculptures of Egypt, Nineveh, and Persepolis, umbrellas are frequently figured, and appear to have been, as now in the East, an attribute of royalty. In Greece and Rome its use was more general, and was probably continued in Italy from ancient times. At the beginning of the 17th c. the U. seems to have been little, if at all, known in England. Then it came into use as a luxurious sunshade; and in the reign of Queen Anne it had become common in London as a screen from the rain, but only for women. The first man who had the courage to carry an umbrella in the streets of London was Jonas Hanway, founder of the Magdalene Hospital, who had just returned from Persia, and was in poor health. Its use, however, was long regarded as a sign of infirmity or effeminacy. At first all umbrellas were imported—chiefly from India, Spain, and France; but now the manufacture of umbrellas has reached enormous proportions, both in Great Britain and in the United States. The umbrellas of China and Japan are of oiled paper, with bamboo ribs, stretchers, and handles.

UMBRELLA BIRD: South Amer. bird (*Cephalopterus ornatus*), about the size of a crow, with deep black plumage. The head is adorned with a large spreading crest with white shafts and glossy blue plumes, capable of being erected at will.

UMBREL'LA-TREE: magnolia found along the Alleghany Mountains from Penn. to Ky., frequently grown for ornament. It is 30–40 ft. high, and has leaves 18–20 in. long and 8–10 in. wide, and white flowers 4–5 in. deep. Its name is derived from the clustering of the leaves at the ends of the flowering shoots. Foreign varieties are the ear-leafed, Guinea, and Queensland umbrella-trees.

UMBRIA, *ŭm'brĭ-a:* ancient division of Italy, w. of Etruria, and n. of the country of the Sabines, and usually described as extending from the Tiber e. to the Adriatic. Tradition leads us to believe that at one time Umbrian territory extended from sea to sea, embracing much, if not all, of the country subsequently occupied by the Etruscans; but when the Umbrians first appear in history as a distinct people, we find them restricted to the ridges of the Apennines, the lowland region bordering on the Adriatic from the Æsis (mod. *Esino*) to the Rubicon being held by a race of Gallic invaders known as the Senones. The most notable towns of U. were Narnia, Interamna, Acriculum, Spoletium, Mevania, Fulginium, Assisium Tifernum, Nuceria, Camerinum, Sentinum, Urbinum, Sena Gallica, Fanum Fortunæ, and Ariminum.

The Umbrians were said by Pliny to be the oldest people of Italy—i.e., of Italian stock; and modern researches into their language (of which we possess one important memorial in the tables of Iguvium: see EUGUBINE TABLES) have demonstrated that they spoke a tongue closely allied to the Oscan (see OSCI), and the oldest of the Italian dialects.

The Umbrians make their first authentic appearance in the wars between the Romans and the Etruscans, B.C. 4th c. They seem to have had no political organization or unity, for some of their tribes took part with the Romans, and others—probably the majority—with the Etruscans. They were subjugated with the latter people; and we read nothing of them again until the third Samnite war, when, in conjunction with the Etruscans and Gauls, they joined the Samnites in their last gallant struggle against the supremacy of Rome (q v.), but were utterly vanquished in the great battle of Sentinum, B.C. 295. The establishment of Roman colonies in the *Gallicus Ager*, or territory of the Senonian Gauls, seems to have completely overawed, and at last to have Romanized them. They stood faithfully by Rome in the dark years of the Hannibalic war, and were among the first to furnish Scipio with volunteers for invasion of Africa. They obtained the Roman franchise B.C. 90, and thenceforth disappear from history as a distinct people.

UMBRIAN, a. *ŭm'brĭ-ăn:* of or pertaining to *Umbrĭa*, a district of central Italy, possessed by the Umbri at an early period B.C. UM'BRIANS, n. plu. the inhabitants of Umbria.

UMBRIERE, n. *ŭm'brĭ-ār* [Norm. F.—from OF. *umbre* —from L. *umbra*, a shade]: in *OE.*, the visor of a helmet; also UMBRERE.

UMBRIFEROUS, a. *ŭm-brĭf'ĕr-ŭs* [L. *umbra*, a shadow, *fero*, I bear]: casting or making a shade. UMBRIF'ER-OUSLY, ad. *-lĭ*.

UMLAUT, n. *ŏm'lowt* [Ger.—from prefix *um-*, indicating alteration; *laut*, sound]: in *philol.*, a kind of assimilation of sounds; the change of the vowel in one syllable through the influence of one of the vowels *a*, *i*, *u*, in the syllable immediately following. It is a common feature in several Teutonic tongues. In German, umlaut is seen in the frequent change of the vowels *a*, *o*, *u*, to *ä*, *ö*, *ü*. In Anglo Saxon it was also common. The change caused by *a* is called *a*-umlaut, and so of the other vowels.

UMPIRE, n. *ŭm'pīr* [OE. *nowmpere*, an arbiter: OF. *nompair*, uneven or odd in number: L. *non par*, not equal]: a third person chosen to decide a controversy left to arbitration, when the two arbitrators disagree, the decision or award of the umpire being final and binding on all parties concerned; a judge; a referee: V. to act as umpire. UMPIRAGE, n. *ŭm'pīr-āj*, the power, right, or authority of an umpire to decide; the decision of an umpire. UM'PIRE-SHIP, n. the office of an umpire—SYN. of 'umpire, n.': judge; arbitrator; referee; arbiter.

UMPQUA, *ŭmp'kwaw*, RIVER: important water-course in Douglas co., Or.; rising by two forks in the Cascade Mountains, flowing n.w. through a fertile, mountain-skirted valley, and emptying into the Pacific Ocean about 20 m. n. of Empire City. The forks unite 8 m. below Roseburg, and the valley is noted for its wool products and placer gold-mining.

UMQUHILE, a. *ŭm'kwĭl* [AS. *hwilum*, for a time, once]: in *Scot.*, late; former; deceased: AD. some time ago; formerly; the same word as WHILOM, *hwī'lŏm*.

UMROHAH, *ŭm-rō'â:* town of Brit. India, dist. of Moradabad, N.W. Provinces; 80 m. e.n.e. of Delhi.—Pop. (1881) 36,145.

UN-, *ŭn* [AS. *un;* Ger. *un*, a privative or negative particle]: an inseparable prefix signifying (1) 'not,' the opposite of; and (2) 'back,' 'reversal,' 'annulment': *un*, signifying 'not,' may be used before almost any adjective, as in *un*fruitful, '*not* fruitful,' the opposite of fruitful; before nouns derived from adjectives, as in *un*fruitfulness, the opposite of fruitfulness; and before adverbs, as in *un*fruitfully: *un*, signifying 'back,' used before (transitive) verbs, denotes reversal of the action or annulment of the act, implied in the verb to which it is prefixed, as to *un*do, *un*bind, *un*say, etc. Before verbs derived from nouns it signifies privation or removal, as to *un*frock, to deprive of a frock; *un*dress, to take off dress. *Note.*—Under UN, those words only are given which are in most general use; when a word is not found, turn to the word less the prefix *un*, or to the primary word, for further explanations and the roots. *Un* is equivalent to the Latin prefix *in* when it signifies *not*. In the use of *un* or *in* before adjectives, usage has greatly varied. As to when it is proper, according to the best usage, to write *un* or *in*, the dictionary should

be consulted. In many cases both *in* and *un* are in good use as prefixes for the same word, and are used indifferently, some writers preferring *un* and others *in*.

UNABASED, a. *ŭn'ă-bāst':* not abased; not humbled.

UNABASHED,, a *ŭn'ă-băsht':* not confused with shame or by modesty.

UNABATED, a. *ŭn'ă-bā'tĕd:* not diminished in strength or violence. UN'ABA'TING, a. not diminishing in strength or violence.

UNABBREVIATED, a. *ŭn'ăb-brē'vĭ-ā-tĕd:* not abbreviated or shortened; uncurtailed.

UNABIDING, a. *ŭn'ă-bī'dĭng:* not abiding or permanent. UN'ABI'DINGLY, ad. UN'ABI'DINGNESS, n.

UNABLE, a. *ŭn-ā'bl:* not able; weak; without adequate knowledge or skill; incapable.

UNABOLISHED, a. *ŭn'ă-bŏl'ĭsht:* not abolished; remaining in force.

UNABRIDGED, a. *ŭn'ă-brĭjd':* not shortened.

UNABROGATED, a. *ŭn-ăb'rō-gā-tĕd:* not annulled.

UNABSOLVED, a. *ŭn'ăb-zŏlvd';* not acquitted or forgiven.

UNABSORBED, a. *ŭn'ăb-sŏrbd';* not imbibed or absorbed.

UNACCENTED, a. *ŭn'ăk-sĕnt'ĕd:* having no accent or force of the voice upon, as a syllable.

UNACCEPTABLE, a. *ŭn'ăk-sĕpt'ă-bl:* not acceptable; not pleasing. UN'ACCEPT'ED, a. not accepted; rejected.

UNACCOMMODATING, a. *ŭn'ăk-kŏm'mō-dā-tĭng:* not ready to oblige: uncompliant. UN'ACCOM'MODATED, a. unfurnished with external conveniences.

UNACCOMPANIED, n. *ŭn'ăk-kŭm'păn-ĭd:* not attended; having no appendages.

UNACCOMPLISHED, a. *ŭn'ăk-kŏm'plĭsht:* not accomplished; not finished; incomplete.

UNACCOUNTABLE, a. *ŭn'ăk-kownt'ă-bl:* not to be accounted for; inexplicable; irresponsible. UN'ACCOUNT'ABLY, ad. *-blĭ.* UN'ACCOUNT'ABIL'ITY, n. state of being unaccountable.

UNACCREDITED, a. *ŭn'ăk-krĕd'ĭt-ĕd:* not accredited; not received; not authorized.

UNACCUSTOMED, a. *ŭn'ăk-kŭs'tŭmd:* not accustomed; not habituated; new; not usual.

UNACHIEVABLE, a. *ŭn'ă-chēv'ă-bl:* that cannot be done. UN'ACHIEVED', a. not accomplished or performed.

UNACHING, a. *ŭn ăk'ĭng:* not feeling or causing pain.

UNACKNOWLEDGED, a. *ŭn'ăk-nŏl'ĕjd:* not recognized; not owned; not avowed.

UNACQUAINTED, a. *ŭn'ăk-kwānt'ĕd:* not having familiar knowledge; unusual. UN'ACQUAINT'ANCE, n. *-ăns*, ignorance; want of knowledge.

UNACQUIRED, a. *ŭn'ăk-kwīrd':* not gained or acquired.

UNACQUITTED, a. *ŭn'ăk-kwĭt'tĕd:* not acquitted.

UNACTED, a. *ŭn-ăkt'ĕd:* not put into execution; not acted, as a drama.

UNACTIVE, a. *ŭn-ăk'tĭv:* not brisk or lively; having no employment: *inactive* is the general spelling.

UNACTUATED, a. *ŭn-ăk'tū-ā-tĕd:* not moved.

UNADAPTED, a. *ŭn'ă-dăpt'ĕd:* not suited.

UNADDICTED, a. *ŭn'ăd-dĭkt'ĕd:* not given or devoted.

UNADDRESSED, a. *ŭn'ăd-drĕst':* not addressed.

UNADJUSTED, a. *ŭn'ăd-jŭst'ĕd:* not settled; not regulated; not liquidated.

UNADMIRED, a. *ŭn'ăd-mīrd':* not regarded with admiration.

UNADMONISHED, a. *ŭn'ăd-mŏn'ĭsht:* not cautioned.

UNADOPTED, a. *ŭn'ă-dŏpt'ĕd:* not received as one's own; not adopted or used.

UNADORED, a. *ŭn'ă-dōrd':* not worshipped.

UNADORNED, a. *ŭn'ă-dawrnd':* not adorned or decorated; not embellished.

UNADULTERATE, a. *ŭn'ă-dŭl'tĕr-āt,* or UN'ADUL'TERATED, a. *-dŭl'tĕr-ā-tĕd:* genuine; pure; not spoiled by admixture or contact.

UNADVENTUROUS, a. *ŭn'ăd-vĕn'tū-rŭs:* not adventurous.

UNADVISABLE, a. *ŭn'ăd-vī'ză-bl:* not advisable; not expedient. UN'ADVISED', a. not prudent; not discreet; done without due thought; rash. UN'ADVI'SEDLY, ad. UN'ADVI'SEDNESS, n. imprudence; rashness.

UNAFFECTED, a. *ŭn'ăf-fĕkt'd:* plain; natural; not labored or artificial; sincere; not moved; not influenced. UN'AFFECT'EDLY, ad. UN'AFFECT'EDNESS, n. the state of being unaffected. UN'AFFECT'ING, a. not adapted to move the passions. UN'AFFEC'TIONATE, a. *-shŭn-āt,* wanting affection.

UNAFFIRMED, a. *ŭn'ăf-fêrmd':* not affirmed.

UNAFFLICTED, a. *ŭn'ăf-flĭkt'ĕd:* free from trouble or distress.

UNAFFRIGHTED, a. *ŭn'ăf-frīt'ĕd:* not frightened or terrified.

UNAGITATED, a. *ŭn-ăj'ĭ-tā-tĕd:* not disturbed; calm.

UNAGREEABLE, a. *ŭn'ă-grē'ă-bl:* in *OE.,* inconsistent; unsuitable.

UNAIDED, a. *ŭn-ād'ĕd:* not assisted. UNAID'ABLE, a. *-ă-bl,* incapable of being aided.

UNAIMING, a. *ŭn-ām'ĭng:* having no particular aim or direction.

UNAKA MOUNTAINS, *ū'na-ka:* s.w. extremity of the Great Smoky Mountains, between Tenn. and N. C.; they extend from the Tennessee river to the Hiawassee river.

UNALARMED, a. *ŭn'ă-lârmd':* not disturbed with fear UN'ALARM'ING, a. not alarming.

UNALASKA, *ô-na-lăs'ka*, formerly written UNALASHKA and OONALASH'KA: island in the North Pacific, belonging to the Fox group of the Aleutian Islands; lat. 55° 52′ n., long. 166° 32′ w. It is 75 m. long, and in some parts 20 m. broad, and has a rugged mountainous surface. It is an important fur-trading centre, and is a point of call for whalers, etc., for all necessary supplies except wood.—Pop. (1890) 900.

UNALLAYED, a. *ŭn'ăl-lād':* not appeased or quieted.

UNALLEVIATED, a. *ŭn'ăl-lē'vĭ-ā-tĕd:* not mitigated.

UNALLIED, a. *ŭn'ăl-līd':* having no connection as by nature, marriage, or treaty; having no powerful relation.

UNALLOYED, a. *ŭn'ăl-loyd':* not reduced or debased by foreign admixture; unmixed.

UNALTERABLE, a. *ŭn-awl'tĕr-ă-bl:* incapable of alteration; unchangeable; immutable. UNAL'TERED, a. not altered or changed. UNAL'TERABLY, ad. UNAL'TERABLENESS, or UNALTERABIL'ITY, n. state of being unalterable.

UNAMAZED, a. *ŭn'ă-māzd':* not astonished; free from astonishment.

UNAMBIGUOUS, a. *ŭn'ăm-bĭg'ū-ŭs:* not obscure; plain; clear; not of doubtful meaning. UN'AMBIG'UOUSLY, ad. UN'AMBIG'UOUSNESS, n. the state or quality of being unambiguous.

UNAMBITIOUS, a. *ŭn'ăm-bĭsh'ŭs:* free from ambition; not aspiring; not ostentatious. UN'AMBI'TIOUSLY, ad.

UNAMENABLE, a. *ŭn'ă-mē'nă-bl:* not amenable or responsible.

UNAMIABLE, a. *ŭn-ā'mĭ-ă-bl:* not adapted to gain affection. UNA'MIABLENESS, n. the state or quality of being unamiable; repulsiveness.

UNANCHORED, a. *ŭn-ăng'kĕrd:* not anchored.

UNANELED, a. *ŭn'ă-nēld'* [see ANELE]: in *OE.*, not having received extreme unction.

UNANIMATED, a. *ŭn-ăn'ĭ-mā-tĕd:* not possessed of life; dull; not enlivened.

UNANIMOUS, a. *ū-năn'ĭ-mŭs* [L. *unus*, one; *anĭmus*, mind: F. *unanime*, unanimous]: being of one mind; agreeing in opinion. UNAN'IMOUSLY, ad. *-lĭ.* UNANIMITY, n. *ū'nă-nĭm'ĭ-tĭ*, or UNAN'IMOUSNESS, n. *-nĕs*, state of being unanimous; agreement in opinion or determination.

UNANNEALED, a. *ŭn'ăn-nēld':* not tempered by heat; suddenly cooled.

UNANNEXED, a. *ŭn'ăn-nĕkst':* not annexed or joined.

UNANNOUNCED, a. *ŭn'ăn-nowns't':* not announced.

UNANOINTED, a. *ŭn'ă-noynt'ĕd:* not anointed; not having received extreme unction.

UNANSWERABLE, a. *ŭn-ăn'sĕr-ă-bl:* that cannot be refuted or answered satisfactorily. UNAN'SWERABLY, ad. UNAN'SWERABLENESS, n., or UNAN'SWERABIL'ITY, n. *-bĭl'ĭ-tĭ*, the state or quality of being unanswerable. UNAN'SWERED, a. not answered; not confuted; not opposed by a reply.

UNAPOSTOLIC, a. *ŭn-ăp'ŏs-tŏl'ĭk*, or UNAP'OSTOL'ICAL, a. *-ĭ-kăl:* not agreeable to apostolic usage; without apostolic authority.

UNAPPALLED, a. *ŭn'ăp-pawld':* not daunted.

UNAPPARELLED, a. *ŭn'ăp păr'ĕld:* not dressed; not clothed.

UNAPPARENT, a. *ŭn'ăp-pâr'ĕnt:* not apparent; obscure; not visible.

UNAPPEALABLE, a. *ŭn'ăp-pēl'ă-bl:* admitting no appeal.

UNAPPEASABLE, a. *ŭn'ăp-pēz'ă-bl:* not to be pacified; implacable. UN'APPEASED', a. not pacified.

UNAPPLAUDED, a. *ŭn'ăp-plawd'ĕd:* not applauded; not praised.

UNAPPLIED, a. *ŭn'ăp-plīd':* not applied; not used according to the intention.

UNAPPRECIATED, a. *ŭn'ăp-prē'shĭ-ā tĕd:* not duly estimated or valued.

UNAPPREHENSIVE, a. *ŭn'ăp-prĕ-hĕn'sĭv:* not suspecting; unsuspicious.

UNAPPRISED, a. *ŭn'ăp-prīzd':* not previously informed.

UNAPPROACHABLE, a. *ŭn'ăp-prōch'ă-bl:* that cannot be approached; inaccessible. UN'APPROACH'ABLY, ad. UN'APPROACHED', a. not to be approached; inaccessible.

UNAPPROPRIATED, a. *ŭn'ăp-prō'prĭ-ā-tĕd:* not applied to any specific object; not granted or given, as to a person or company.

UNAPPROVED, a. *ŭn'ăp-prôvd':* not having received approbation; not approved. UN'APPRO'VING, a. not approving.

UNAPT, a. *ŭn-ăpt':* not apt; not qualified; not suitable; dull; unready. UNAPT'LY, ad. UNAPT'NESS, n. the state of being dull or unready to learn; unfitness; want of apprehension; unreadiness.

UNARGUED, a. *ŭn-âr'gūd:* not discussed; in *OE.*, not censured.

UNARM, v. *ŭn-ârm':* to strip of armor; to deprive of arms. UNARMED, a. *ŭn-ârmd'*, without arms; not equipped; in *bot.*, not furnished with scales or prickles, or the like.

UNARRANGED, a. *ŭn'ăr-rānjd':* not arranged or disposed in order.

UNARRAYED, a. *ŭn'ăr-rād':* not dressed; not disposed in order.

UNARRESTED, a. *ŭn'ăr-rĕst'ĕd:* not stopped; not apprehended.

UNARTICULATED, a. *ŭn'âr-tĭk'ū-lā-tĕd:* not articulated or distinctly pronounced.

UNASCERTAINABLE, a. *ŭn-ăs'sĕr-tān'ă-bl:* that cannot be ascertained or reduced to certainty. UNAS'CERTAINED', a. not known with certainty.

UNASHAMED, a. *ŭn'ă-shāmd':* not ashamed.

UNASKED, a. *ŭn ăskt':* not sought by entreaty; unsolicited

UNASPIRING, a. *ŭn'ăs-pī'rĭng:* not aspiring or ambitious. UN'ASPI'RINGLY, ad.

UNASSAILABLE, a. *ŭn'ăs-sāl'ă-bl:* that cannot be assailed or attacked. UN'ASSAILED', a. not attacked.

UNASSAULTED, a. *ŭn'ăs-sawlt'ĕd:* not attacked with violence.

UNASSAYED, a. *ŭn'ăs-sād':* not attempted; not tried or tested—applied to metals.

UNASSERTED, a. *ŭn'ăs-sĕrt'ĕd:* not affirmed or vindicated.

UNASSESSED, a. *ŭn'ăs-sĕst':* not assessed or rated.

UNASSIGNABLE, a. *ŭn'ăs-sīn'ă-bl:* that cannot be transferred by assignment or indorsement. UN'ASSIGNED', a. not transferred; not declared.

UNASSIMILATED, a. *ŭn'ăs-sĭm'ĭ-lā-tĕd:* not made to resemble; not united with or actually made a part; not made into the fluids or solids of the body, as food.

UNASSISTED, a. *ŭn'ăs-sĭst'ĕd:* not aided or helped. UN'ASSIST'ING, a. giving no help.

UNASSOCIATED, a. *ŭn'ăs-sō'shĭ-ā-tĕd:* not united with or in company with.

UNASSUMED, a. *ŭn'ăs-sūmd':* not assumed. UN'ASSU'MING, a. not bold or forward; modest; not arrogant.

UNASSURED, a. *ŭn'ă-shôrd':* not bold or confident; not insured.

UNATONED, a. *ŭn'ă-tōnd':* not expiated. UN'ATO'NABLE, a. not to be appeased; in *OE.*, not reconcilable.

UNATTACHED, a. *ŭn'ăt-tăcht':* not arrested; not closely adhering; not united by affection; having no fixed interest; not attached to any particular regiment, as an army officer.

UNATTACKED, a. *ŭn'ăt-tăkt':* not attacked or assaulted

UNATTAINABLE, a. *ŭn'ăt-tān'ă-bl:* not to be obtained; being out of reach. UN'ATTAINED', a. not attained or reached.

UNATTEMPTED, a. *ŭn'ăt-tĕm'tĕd:* not tried or essayed.

UNATTENDED, a. *ŭn'ăt-tĕnd'ĕd:* not attended; not accompanied; without attendants.

UNATTESTED, a. *ŭn'ăt-tĕst'ĕd:* not attested; without witness.

UNATTIRED, a. *ŭn'ăt-tīrd':* not attired or adorned.

UNATTRACTED, a. *ŭn'ăt-trăk'tĕd:* not affected or influenced, as by attraction. UN'ATTRAC'TIVE, a. not attractive or prepossessing.

UNAUTHENTICATED, a. *ŭn'aw-thĕn'tĭ-kā-tĕd:* not proved to be genuine; not made certain by authority.

UNAUTHORIZED, a. *ŭn-aw'thŏr-īzd:* not warranted by proper authority.

UNAVAILABLE, a. *ŭn'ă-vāl'ă-bl:* not available; not having sufficient power to produce the intended effect; useless; ineffectual; vain. UN'AVAIL'ING, a. not having the desired effect; useless.

UNAVENGED, a. *ŭn'ă-vĕnjd':* not avenged; not having obtained satisfaction; not punished.

UNAVERTED, a. *ŭn'ă-vĕrt'ĕd:* not turned away.

UNA VOCE, phrase, *ū'nâ vō'sē* [L.]: with one voice; unanimously.

UNAVOIDABLE, a. *ŭn'ă-voyd'ă-bl:* that cannot be shunned; certain; inevitable. UN'AVOID'ABLY, ad. UN'AVOID'ABLENESS, n.

UNAVOWED, a. *ŭn'ă-vowd':* not acknowledged.

UNAWAKED, a. *ŭn'ă-wākt'*, or UN'AWAK'ENED, a. *-wāk'nd:* not roused from sleep; not roused from spiritual or mental slumber or torpidity.

UNAWARE, a. *ŭn'ă-wär':* not aware; inattentive; unexpectant. UN'AWARE', or UN'AWARES', ad. *-wärz'*, suddenly; unexpectedly; without thought; without premeditation.

UNAWED, a. *ŭn-awd':* not restrained by fear.

UNBACKED, a. *ŭn-băkt':* that has never been mounted or taught to bear a rider, as a horse; unsupported.

UNBAFFLED, a. *ŭn-băf'fld:* not defeated or confounded.

UNBAKED, a. *ŭn-bākt':* not baked or made ready for food.

UNBALANCED, a. *ŭn-băl'ănst:* not poised; not adjusted; not settled; not brought to an equality, as the credit and debtor side of an account.

UNBALLASTED, a. *ŭn-băl'lăs-tĕd:* not kept steady by ballast; unsteady; without ballast.

UNBANDAGED, a. *ŭn-băn'dājd:* not wrapped with a bandage.

UNBANDED, a. *ŭn-bănd'ĕd:* lacking a band or string.

UNBAPTIZED, a. *ŭn'băp-tīzd':* not having received the sacrament of baptism.

UNBAR, v. *ŭn-bâr':* to unfasten; to open by removing bolts or bars.

UNBARBED, a. *ŭn-bârbd'* [L. *barba*, a beard]: in *OE.*, not shaven; also, bare.

UNBARKED, a. *ŭn-bârkt':* stripped of the bark; decorticated: *barked* is the word now used for *unbarked.*

UNBASHFUL, a. *ŭn-băsh'fûl:* not bashful; impudent; shameless.

UNBATED, a. *ŭn-bā'tĕd:* in *OE.*, not blunted; not repressed.

UNBATTERED, a. *ŭn-băt'tĕrd:* not injured by blows.

UNBEARABLE, a. *ŭn-bär'ă-bl:* not bearable; that cannot be borne or endured.

UNBEATEN, a. *ŭn-bēt'n:* not beaten; untrodden.

UNBECOMING, a. *ŭn'bĕ-kŭm'ĭng:* unsuitable; improper for the person or character; indecent. UN'BECOM'INGLY, ad. UN'BECOM'INGNESS, n. *-nĕs.*

UNBEFITTING, a. *ŭn'bĕ-fĭt'tĭng:* unsuitable; unbecoming.

UNBEFRIENDED, a. *ŭn'bĕ-frĕnd'ĕd:* not supported by friends.

UNBEGOT, a. *ŭn'bĕ-gŏt'*, or UN'BEGOT'TEN, a. *-gŏt'tn:* not generated; eternal; not yet generated.

UNBEGUN, a. *ŭn'bĕ-gŭn':* not yet begun.

UNBEHELD, a. *ŭn'bĕ-hĕld':* unseen; not beheld.

UNBELIEF, n. *ŭn'bĕ-lēf':* the withholding of belief; skepticism; infidelity; disbelief of divine revelation. UN'BELIEV'ER, n. *-lēv'ĕr*, an incredulous person; an infidel; one who does not believe in a divine revelation. UN'BELIEV'ING, a. incredulous; infidel; not acknowledging a divine revelation. UN'BELIEVED', a. discredited.—SYN. of 'unbeliever': infidel; deist; theist; freethinker; skeptic.

UNBELOVED, a. *ŭn'bĕ-lŭvd':* not loved.

UNBEND, v. *ŭn-bĕnd':* to become unbent; to relax; to make straight; to set at ease for a time; to become less rigid in manner; among *seamen,* to take the sails from the yards and stays; to cast loose, as a cable from an anchor; to untie one rope from another. UNBEND'ING, imp. relaxing from a strain: ADJ. unyielding; resolute; inflexible. UNBENT', pt. pp. relaxed; not strained; unstrung; loosed. UNBEND'INGLY, ad.

UNBENEFICED, a. *ŭn-bĕn'ĕ-fĭst:* not holding a benefice or church living.

UNBENIGHTED, a. *ŭn'bĕ-nīt'ĕd:* not visited by darkness.

UNBENIGN, a. *ŭn'bĕ-nīn':* malignant; malevolent.

UNBESEEMING, a. *ŭn'bĕ-sēm'ĭng:* unbecoming; not befitting.

UNBESOUGHT, a. *ŭn'bĕ-sawt':* not sought by petition, or entreaty.

UNBESPOKEN, a. *ŭn'bĕ-spō'kn:* not bespoken or ordered beforehand.

UNBESTOWED, a. *ŭn'bĕ-stōd':* not given; not disposed of.

UNBEWAILED, a. *ŭn'bĕ-wāld':* not lamented.

UNBIAS, v. *ŭn-bī'ăs:* to free from bias or prejudice. UNBI'ASING, imp. UNBI'ASED, pp. *-ăst,* freed from prejudice or bias: ADJ. impartial; unprejudiced.

UNBID, a. *ŭn-bĭd'*, or UNBID'DEN, a. *-bĭd'n:* not commanded; spontaneous; uninvited.

UNBIGOTED, a. *ŭn-bĭg'ŏt-ĕd:* free from bigotry.

UNBIND, v. *ŭn-bīnd':* to set free; to untie; to loose. UNBIND'ING, imp. setting free; untying. UNBOUND', pt. pp. *-bownd'*, set free.

UNBISHOP, v. *ŭn-bĭsh'ŏp:* to deprive of episcopal orders.

UNBIT, a. *ŭn-bĭt'*, or UNBIT'TEN, a. *-bĭt'n:* not bitten.

UNBIT, v. *ŭn-bĭt':* to unbridle; among *seamen*, to remove the turns from off the bitts, as to *unbit* a cable.

UNBLAMABLE, a. *ŭn-blā'mă bl:* free from blame or cause of blame; innocent; faultless. UNBLA'MABLY, ad. UNBLA'MABLENESS, n. the state of being unblamable. UNBLAMED', a. free from censure.

UNBLEACHED, a. *ŭn-blēcht':* not bleached or whitened.

UNBLEMISHED, a. *ŭn-blĕm'ĭsht:* not stained; free from blemish or from reproach; free from deformity; irreproachable. UNBLEM'ISHABLE, a. *-ĭsh-ă-bl,* incapable of being blemished.

UNBLENCHED, a. *ŭn-blĕnsht':* not confounded; undiminished. UNBLENCH'ING, a. not shrinking or flinching; firm.

UNBLENDED, a. *ŭn-blĕnd'ĕd:* not blended or mingled.

UNBLESSED, or UNBLEST, a. *ŭn blĕst':* excluded from benediction; unhappy.

UNBLIGHTED, a. *ŭn-blīt'ĕd:* not blighted; unblasted.

UNBLOODY, a. *ŭn-blŭd'ĭ,* and UNBLOOD'IED, a. *-blŭd'ĭd:* not stained with blood; not cruel.

UNBLOWN, a. *ŭn-blōn':* not having the bud expanded; not inflated with wind.

UNBLUNTED, a. *ŭn-blŭnt'ĕd:* not blunted or made obtuse or dull.

UNBLUSHING, a. *ŭn-blŭsh'ĭng:* destitute of shame; impudent. UNBLUSH'INGLY, ad.

UNBODIED, a. *ŭn-bŏd'ĭd:* freed from the body; incorporeal.

UNBOILED, a. *ŭn-boyld':* not cooked in boiling water.

UNBOLT, v. *ŭn-bōlt':* to remove a bolt from, as from a door; to unfasten; to set open. UNBOLT'ED, pp. a. freed from fastening by bolts; not having the bran separated, as in flour; unsifted.

UNBONNETED, a. *ŭn-bŏn'nĕt-ĕd:* without hat or bonnet; having no hat or bonnet on.

UNBOOKISH, a. *ŭn-bŭk'ĭsh:* having but little of the knowledge that is obtained from books; not studious in books; unlearned; illiterate.

UNBOOTED, a. *ŭn-bōt'ĕd:* not having boots on.

UNBORN, a. *ŭn bawrn':* not brought into life; still to appear; future.

UNBORROWED, a. *ŭn-bŏr'rōd:* genuine; original; one's own.

UNBOSOM, v. *ŭn-bŭz'ŭm:* to disclose freely, as opinions and feelings; to reveal in confidence. UNBOS'OMING, imp. UNBOS'OMED, pp. revealed in confidence, as one's feelings and griefs.

UNBOTTOMED, a. *ŭn-bŏt'tŏmd:* without a bottom; having no solid foundation.

UNBOUGHT, a. *ŭn-bawt':* obtained without money or purchase; not finding a purchaser.

UNBOUND, a. *ŭn-bownd':* not bound; loose; free from obligation; without a cover, as a book; not yet bound up into a volume or volumes.

UNBOUNDED, a. *ŭn-bownd'ĕd:* having no bound or limit; infinite; unlimited; without check or control; unrestrained; extravagant; interminable. UNBOUND'EDLY, ad.

UNBOWED, a. *ŭn-bowd':* not bent or arched, as the body in stooping or kneeling.

UNBRACE, v. *ŭn brās':* to loose; to relax. UNBRA'CING, imp. UNBRACED', pp.

UNBREATHABLE, a. *ŭn-brēth'ă-bl:* that cannot be respired or breathed. UNBREATHED', a. not breathed; in *OE.*, unexercised.

UNBRED, a. *ŭn-brĕd':* not polished in manners; ill educated; rude; in *OE.*, not begotten.

UNBREECHED, a. *ŭn-brĭcht':* having no breeches.

UNBREWED, a. *ŭn-brōd':* not mixed; genuine; pure.

UNBRIBED, a. *ŭn-brībd':* not corrupted or influenced by a gift of money.

UNBRIDLED, a. *ŭn-brī'dld:* unrestrained; licentious.

UNBROKEN, a. *ŭn-brō'kn:* not violated, as a promise; not subdued; not tamed; not accustomed to the saddle or harness, as a horse. UNBROKE', a. *-brōk'*, for UNBROKEN.

UNBROTHERLY, a. *ŭn-brŭth'ĕr-lĭ:* not becoming a brother; unkind.

UNBRUISED, a. *ŭn-brōzd':* not bruised; not hurt.

UNBUCKLE, v. *ŭn-bŭk'kl:* to loose from buckles; to unfasten. UNBUCK'LING, imp. UNBUCK'LED, pp.

UNBUILD, v. *ŭn-bĭld':* in *OE.*, to raze; to destroy. UNBUILT, a. *ŭn-bĭlt'*, not yet built or erected.

UNBUOYED, a. *ŭn-boyd':* unmarked by buoys, as a channel; not borne up.

UNBURIED, a. *ŭn-bĕr'ĭd:* not put under-ground; not interred.

UNBURNED, a. *ŭn-bĕrnd'*, or UNBURNT', a. *-bĕrnt':* not consumed by fire; not scorched; not baked.

UNBURTHEN, v. *ŭn-bĕr'thn*, or UNBUR'DEN, v. *-dn:* to ease; to throw off; to relieve the mind or heart by revealing what lies heavily on it.

UNBUSINESS-LIKE, a. *ŭn-bĭz'nĕs-līk:* not like one accustomed to business; confused and irregular in the management of ordinary affairs.

UNBUTTON, v. *ŭn-bŭt'tn:* to loose the fastenings by buttons.

UNCAGE, v. *ŭn-kāj':* to release from a cage. UNCAGED', a. released from a cage or confinement.

UNCALCINED, a. *ŭn-kăl'sīnd:* not calcined.

UNCALCULATING, a. *ŭn-kăl'kū-lā-tĭng:* not in the habit of studying details; inconsiderate.

UNCALLED, a. *ŭn-kawld':* not summoned; not invited. UNCALLED-FOR, a. not required or needed; improper.

UNCANCELLED, a. *ŭn-kăn'sĕld:* not cancelled, crossed out, or erased; not annulled.

UNCANDID, a. *ŭn-kăn'dĭd:* not frank or sincere. UN-CAN'DIDLY, ad.

UNCANNY, a. *ŭn-kăn'nĭ* [see CANNY]: in *Scot.* and *prov. Eng.*, not safe to meddle with; dangerous; not favorable or propitious; preternatural; ghost-like.

UNCANONICAL, a. *ŭn'kă-nŏn'ĭ-kăl:* not agreeable to the canons; not acknowledged as authentic. UN'CANON'-ICALLY, ad. UN'CANON'ICALNESS, n. the state of being uncanonical.

UNCANVASSED, a. *ŭn-kăn'văst:* not canvassed.

UNCAP, v. *ŭn-kăp':* to remove a cap or cover from; to open.

UNCAPABLE, a. *ŭn-kā'pă-bl:* not capable; incapable.

UNCARED-FOR, a. *ŭn-kärd'fŏr:* not regarded or heeded.

UNCA'RIA: see GAMBIR.

UNCAS, *ŭng'kass:* Indian chief: about 1588–1682; b. in the Pequot settlement, e. Conn. He became a war chief of his tribe, but about 1635 headed a revolt against Sassacus, the sachem, organized his followers as an independent tribe, to which he gave the name Mohegan, formerly borne by the Pequots, and made friends with the whites. In 1637 he aided the English in their war against the Pequots, and 1643 was their ally in the war against the Narragansetts, in which he defeated and captured their sachem, Miantonomoh. Several tribes combined against him 1648, but with little success; and 1657 his people were relieved, while being besieged by the Narragansetts, by the English under Ensign Leffingwell. A monument to his memory has been erected in Norwich, Conn.

UNCASE, v. *ŭn-kās':* to take off or out, as from a cover; to display or exhibit the colors of a regiment.

UNCAUGHT, a. *ŭn-kawt':* not yet caught or taken.

UNCAUSED, a. *ŭn-kawzd':* existing without an author or a cause.

UNCEASING, a. *ŭn-sēs'ĭng:* continual; not intermitting; uninterrupted. UNCEAS'INGLY, ad.

UNCELEBRATED, a. *ŭn-sĕl'ĕ-brā-tĕd:* not solemnized.

UNCENSURED, a. *ŭn-sĕn'shûrd:* not censured; exempt from blame.

UNCEREMONIOUS, a. *ŭn'sĕr-ĕ-mō'nĭ-ŭs:* without ceremony; not formal. UN'CEREMO'NIOUSLY, ad.

UNCERTAIN, a. *ŭn-sĕr'tĭn:* not certain or sure; doubtful; unsettled; precarious. UNCER'TAINTY, n. want of certainty or precision; doubtfulness; something unknown.

UNCHAIN, v. *ŭn-chān':* to unfasten, undo, or remove the chain; to set free from chains or restraint.

UNCHALLENGED, a. *ŭn-chăl'lĕnjd:* not objected to; not called to account.

UNCHANCY, a. *ŭn-chăn'sĭ* [*un*, not, and *chance*]: in *Scot.*, not lucky; dangerous.

UNCHANGEABLE, a. *ŭn-chānj'ă-bl:* not subject to variation or change; immutable. UNCHANGE'ABLENESS, n. the state or quality of being subject to no change; immutability. UNCHANGE'ABLY, ad. UNCHANGED', a. not changed or altered. UNCHANG'ING, a. suffering no alteration. UNCHANG'INGLY, ad.

UNCHARGE, v. *ŭn-chârj':* in *OE.*, to retract an accusation. UNCHARGED', a. not loaded, as a gun.

UNCHARITABLE, a. *ŭn chăr'ĭ-tă-bl:* contrary to Christian love; severe in judging; harsh. UNCHAR'ITABLY, ad. UNCHAR'ITABLENESS, n. want of charity.

UNCHARTERED, a. *ŭn-châr'tèrd:* having no charter.

UNCHARY, a. *ŭn-chā'rĭ:* not cautious; not wary; not frugal.

UNCHASTE, a. *ŭn-chāst:* not chaste; not pure; libidinous. UNCHASTE'LY, ad. UNCHAS'TITY, n. *-chăs-tĭ-tĭ*, lewdness; unlawful indulgence of the sexual appetite.

UNCHASTISED, a. *ŭn'chăs-tīzd':* not corrected or punished.

UNCHECKED, a. *ŭn-chĕkt':* not restrained or hindered; not contradicted.

UNCHECKERED, or UNCHEQUERED, a. *ŭn-chĕk'èrd:* not checkered; not diversified.

UNCHEERFUL, a. *ŭn-chēr'fûl:* gloomy; melancholy; sad. UNCHEER'FULNESS, n. *-nĕs*, gloominess of temper.

UNCHEWED, a. *ŭn-chôd':* not masticated or prepared by the teeth.

UNCHILD, v. *ŭn chīld':* in *OE.*, to deprive of children; to render unworthy of the character of a child.

UNCHIVALROUS, a. *ŭn-shĭv'ăl-rŭs:* not according to chivalry.

UNCHRISTENED, a. *ŭn-krĭs'nd:* not baptized and named.

UNCHRISTIAN, a. *ŭn-krĭst'yăn:* contrary to the principles of Christianity; not converted to the Christian faith; infidel UNCHRIST'IANIZE, v. to turn from the Christian faith.

UNCHURCH, v. *ŭn-chèrch':* to expel from a church.

UNCIAL a. *ŭn'shal* [L. *uncĭālis*, pertaining to an ounce or inch—from *uncĭa*, the twelfth part of anything: F. *once;* It. *oncia*, an ounce or an inch—*lit.*, a letter an inch in size]: noting certain characters or letters of a large round kind between capital and small letters, used in the writing of anc. MSS., and in anc. inscriptions from the 3d to the 10th c. A.D.; written or carved in uncial letters: N. an uncial letter, or a manuscript written in uncials; a letter standing for a word in anc. inscriptions.—*Uncial Letters*, which began to take the place of capitals in the middle of the 3d c., differ from capitals (in which the oldest Greek and Latin MSS. are written) in being composed

or rounded and not straight lines, and in showing tendency toward greater expedition in style. Uncial writing arose as writing on papyrus or vellum became common, the necessity for more rapid execution leading to the practice of curving the lines. It was more easily learned than the cursive style, and this was probably the cause of its becoming the favorite mode of writing books of importance among the monkish scribes; while legal instruments, which required greater dispatch, were executed by professional scribes in a corrupted form of the Roman cursive hand. Uncial writing prevailed from the 6th to the 10th c. The following specimens of uncial Greek and Latin writing are from a MS. of the four gospels and Acts of the Apostles in both languages, written early in the 6th c., and presented to the Univ. of Cambridge by Theodore Beza 1581. The passage is from John xxi. 19—'signifying by what death he should glorify God.' Dur-

Greek.

Latin.

ing the 6th and 7th c. a transitional style of writing prevailed in Italy, and to some extent elsewhere, in which the letters approximated more nearly to the Roman cursive hand: this passed by gradual transition into the *minuscule* manner, or small hand, which from the beginning of the 10th c. became usual in MSS.—See Silvestre's *Universal Palæography*, translated and edited by Sir F. Madden (Lond. 1850); *Traité de Diplomatique*, par deux Religieux Benedictins de la Congrégation de St. Maur (Par. 1755).

UNCIATIM, ad. *ŭn-sĭ-ā'tĭm* [L. *uncĭa*, an ounce]: ounce by ounce.

UNCIFORM, a. *ŭn'sĭ fawrm* [L. *uncus*, a hook; *forma*, shape]: having a curved or hooked form, applied to the last bone of the second row of the wrist-bones. UN'CINATE, a, *-nāt* [L. *uncīnātus*, hooked]: in *bot.*, provided with a hooked process; furnished with hooked spines.

UNCIRCUMCISED, a. *ŭn-sĕr'kŭm-sīzd:* not circumcised, applied to a Gentile as opposed to a Jew; sometimes in *N. Test.*, having had the operation of circumcision concealed. UNCIR'CUMCI'SION, n. *-sĭzh'ŭn*, want of circumcision, applied to the Gentiles, as opposed to Jews.

UNCIRCUMSCRIBED, a. *ŭn-sĕr'kŭm-skrībd':* not bounded or limited.

UNCIVIL, a. *ŭn sĭv'ĭl:* not courteous in manners; not polite; rude. UNCIV'ILLY, ad. UNCIV'ILIZED, a. not reclaimed from savage life; rude; coarse.—SYN. of 'uncivil': uncourteous; discourteous; unpolite; uncourtly; unmannered; clownish.

UNCLAIMED, a. *ŭn-klāmd':* not demanded; not called for.

UNCLARIFIED, a. *ŭn-klăr'ĭ-fīd:* not purified or made clear.

UNCLASP, v. *ŭn-klăsp':* to open what is fastened with a clasp; to open that which clasps or embraces; to release from an embrace; in *OE.*, to disclose.

UNCLASSIC, a. *ŭn-klăs'sĭk*, or UNCLAS'SICAL, a. *-sĭ-kăl:* not according to the best models of writing; not pertaining to or in accord with the classical writers, or to classical style.

UNCLE, n. *ŭng'kl* [F. *oncle*—from L. *avun'cŭlus*, an uncle]: the brother of one's father or mother; a name also given to the husband of an aunt.

UNCLEAN, a. *ŭn-klēn':* foul; dirty; filthy; ceremonially impure; unchaste. UNCLEANLY, a. *ŭn-klĕn'lĭ*, foul; filthy; nasty. UNCLEAN'LINESS, n. *-klĕn-*, want of cleanliness. UNCLEAN'NESS, n. *-klēn-*, foulness; dirtiness; ceremonial impurity; defilement by sin; unchastity; lewdness. UNCLEANSED', a. *-klĕnzd*, not purified.

UNCLEAN'NESS, in the Old Testament: state of bodily infirmity which, for the time being, excluded the sufferer from the 'holy community.' This state of disability was induced in a variety of ways: birth, death, the different sexual functions and infirmities, all were, in different manner, causes of uncleanness, and treated according to their different degrees. To a certain extent some incongruous admixtures of plants, animals, even of materials in one garment, etc., also may be reckoned among things that 'defiled' or gave rise to a certain uncleanness. Fruits of a tree during its first three years were regarded as 'uncircumcised' and unclean and not to be eaten. See PURIFICATION: LEPROSY.

UNCLEAVABLE, a. *ŭn-klēv'ă-bl:* that cannot be split.

UNCLERICAL, a. *ŭn-klĕr'ĭ-kăl:* unbecoming a clergyman; contrary to the clerical character.

UN'CLE SAM: jocular name of the United States government or nation, used as John Bull is with respect to England; supposably a humorous extension of the letters U. S. (United States).

UNCLE TOM: hero of *Uncle Tom's Cabin:* see HENSON, JOSIAH: also STOWE, HARRIET ELIZABETH (BEECHER).

UNCLEW, v. *ŭn-klō':* to undo.

UNCLIPPED, a. *ŭn-klĭpt':* not clipped; not diminished or shortened by clipping.

UNCLOAKED, a. *ŭn-klōkt':* not covered or disguised.

UNCLOG, v. *ŭn-klŏg':* to free from anything that retards motion; to set at liberty. UNCLOGGED', a. set free from obstructions.

UNCLOISTER, v. *ŭn-kloys'tĕr:* to set at large; to free from confinement.

UNCLOSE, v. *ŭn-klōz':* to open; to break the seal of, as a letter. UNCLO'SING, imp. breaking the seal of. UNCLOSED, pp.: ADJ. open; not finished; not sealed.

UNCLOTHE, v. *ŭn-klōth':* to strip of clothes; to make naked. UNCLOTH'ING, imp.: N. act of taking off clothes. UNCLOTHED', pp.: ADJ. not clothed; wanting clothes.

UNCLOUDED, a. *ŭn-klowd'ĕd:* free from clouds; not obscured. UNCLOUD'EDNESS, n. freedom from obscurity or gloom. UNCLOUD'Y, a. free from clouds; clear; free from obscurity or gloom.

UNCOATED, a. *ŭn-kōt'ĕd:* not covered with a coat.

UNCOCK, v. *ŭn-kŏk':* to let down the hammer of a gun or pistol.

UNCOFFINED, a. *ŭn-kŏf'fĭnd:* not furnished with or placed in a coffin.

UNCOIF, v. *ŭn-koyf':* to pull the cap off. UNCOIFED', a. not wearing a coif or cap.

UNCOIL, v. *ŭn-koyl':* to unwind or open, as the turns of a rope.

UNCOINED, a. *ŭn-koynd':* not coined; in bars or ingots.

UNCOLLECTED, a. *ŭn'kŏl-lĕk'tĕd:* not brought together; not recovered from confusion or wandering, as the mind.

UNCOLORED, a. *ŭn-kŭl'ĕrd:* not stained or dyed; not heightened in description.

UNCOMBED, a. *ŭn-kōmd':* not dressed with a comb.

UNCOMBINED, a. *ŭn'kŏm-bīnd':* not combined; simple; separate. UN'COMBI'NABLE, a. incapable of being combined or united.

UNCOMEATABLE, a. *ŭn'kŭm-ăt'ă-bl* [*un, come, at,* and *able*]: in *familiar language,* that cannot be come at; inaccessible.

UNCOMELY, a. *ŭn-kŭm'lĭ:* wanting in grace; unseemly. UNCOME'LINESS, n. *-nĕs,* want of beauty or grace.

UNCOMFORTABLE, a. *ŭn-kŭm'fĕrt-ă-bl:* affording no comfort; giving uneasiness; gloomy. UNCOM'FORTABLY, ad. UNCOM'FORTABLENESS, n. the want of ease or rest.

UNCOMMANDED, a. *ŭn'kŏm-mând'ĕd:* not required by order or law; without the proper officers, as in the case of troops.

UNCOMMENDED, a. *ŭn'kŏm-mĕnd'ĕd:* not praised or lauded. UN'COMMEN'DABLE, a. not worthy of praise or approbation.

UNCOMMISERATED, a. *ŭn'kŏm-mĭz'ĕr-ā-tĕd:* not pitied.

UNCOMMITTED, a. *ŭn'kŏm-mĭt'tĕd:* not committed; not pledged by anything said or done; not referred to a committee, as in parliament.

UNCOMMON, a. *ŭn-kŏm'mŏn:* not usual; rare; not often seen or known. UNCOM'MONLY, ad. to an unusual degree. UNCOM'MONNESS, n. *-mŏn-nĕs,* the state of being uncommon; infrequency; rareness.—SYN. of 'uncommon': unusual; unwonted; rare; scarce; infrequent.

UNCOMMUNICATED, a. *ŭn'kŏm-mū'nĭ-kā-tĕd:* not disclosed or delivered to others. UN'COMMU'NICATIVE, a. not communicative; reserved.

UNCOMPANIONABLE, a. *ŭn'kŏm-păn'yŭn-ă-bl:* not companionable; not sociable.

UNCOMPASSIONATE, a. *ŭn'kŏm-păsh'ŭn-āt:* having no pity or mercy.

UNCOMPENSATED, a. *ŭn'kŏm'pĕn-sā-tĕd:* not compensated; not rewarded.

UNCOMPLAINING, a. *ŭn'kŏm-plān'ĭng:* not murmuring or disposed to murmur.

UNCOMPLAISANT, a. *ŭn-kŏm'plā-zănt':* not civil; not courteous.

UNCOMPLETED, a. *ŭn'kŏm-plē'tĕd:* not completed; not finished.

UNCOMPLICATED, a. *ŭn-kŏm'plĭ-kā-tĕd:* not complicated; simple.

UNCOMPLIMENTARY, a. *ŭn'kŏm-plĭ-mĕn'tėr-ĭ:* not expressing civility or praise; rude.

UNCOMPLYING, a. *ŭn'kŏm-plī'ĭng:* unbending, as in disposition; not yielding to request or command; obdurate.

UNCOMPOUNDED, a. *ŭn'kŏm-pownd'ĕd:* not mixed; not intricate; simple.

UNCOMPREHENSIVE, a. *ŭn'kŏm-prĕ-hĕn'sĭv:* not comprehensive; unable to comprehend; in *OE.*, incomprehensible.

UNCOMPRESSED, a. *ŭn'kŏm-prĕst':* free from compression.

UNCOMPROMISING, a. *ŭn-kŏm'prō-mī'zĭng:* not compromising; not agreeing to terms; unyielding.

UNCONCEALED, a. *ŭn'kŏn-sēld':* not concealed or hid; not kept close or secret.

UNCONCEIVED, a. *ŭn'kŏn-sēvd':* not thought or imagined.

UNCONCERN, n. *ŭn'kŏn-sėrn':* want of concern; absence of anxiety; indifference. UN'CONCERNED', a. not anxious; having no interest in; unmoved; indifferent. UN'CONCERN'EDLY, ad. with entire indifference; without interest or affection.

UNCONCILIATED, a. *ŭn'kŏn-sĭl'ĭ-ā-tĕd:* not propitiated; not brought into a state of friendship. UN'CONCIL'IATING, a. not of winning or engaging manners; not adapted to gain favor. UN'CONCIL'IATORY, a. not tending to gain favor.

UNCONCLUDED, a. *ŭn'kŏn-klō'dĕd:* not concluded or finished; not decided; not closed.

UNCONCOCTED, a. *ŭn'kŏn-kŏk'tĕd:* not concocted; not digested; not matured.

UNCONDEMNED, a. *ŭn'kŏn-dĕmd':* not condemned; not judged guilty; not disapproved, as a custom.

UNCONDENSED, a. *ŭn'kŏn-dĕnst':* not reduced to a smaller compass; not returned into its original form, as steam into water.

UNCONDITIONAL, a. *ŭn'kŏn-dĭsh ŭn-ăl:* absolute; unreserved; not limited by conditions. UN'CONDITIONALLY, ad. without terms of limitation. UNCONDI'TIONED, a. *-dĭsh'ŭnd,* not having conditions or relations; absolute. THE UNCONDITIONED, in *metaph.*, that which is absolute or without limitation.

UNCONFINED, a. *ŭn'kŏn-fīnd':* free from restraint or control; unbounded. UNCONFI'NABLE, a. *-fī'nă-bl,* incapable of being confined; boundless.

UNCONFIRMED, a. *ŭn'kŏn-fĕrmd':* not confirmed or established; not fortified by resolution; not strengthened by additional testimony; not confirmed according to the chh. ritual.

UNCONFORMABLE, a. *ŭn'kŏn-fawrm'ă-bl:* not conforming; not consistent; not agreeable or agreeing; in *geol.*, applied to strata when one stratum or series of strata is laid on the upturned edges of another series. UN'CONFORM'ABLY, ad. UN'CONFORM', a. OE. for UNCONFORMABLE. UN'CONFORM'ITY, n. *-ĭ-tĭ,* disagreement; absence of conformity.

UNCONFORM'ABLE STRATA: strata which rest on the more or less inclined edges of older beds. The existence of unconformability in a series of strata indicates an interval sufficiently long to permit of the consolidation, disturbance, and upheaval, denudation, and subsequent depression of the inferior beds. No indication of the period that has intervened is to be found in the unconformability itself; but some idea of it may be obtained by examination of the strata known to have been deposited elsewhere subsequent to the inferior rocks and previous to the overlying unconformable deposits. Numerous examples of unconformability occur in N. America: thus, the Eozoic rocks are tilted and planed off, showing that there was a great lapse of time before the Primordial sands were deposited on them in many places. Sometimes rocks of a comparatively late age rest on the earlier, the intervening ages not being represented. A useless expenditure of money in searching for minerals has been the frequent result of not taking the existence of unconformable strata into account. It seemed natural to expect that the Permian rocks of Upper Annandale (Scotland) covered beds of the true Coal measures; but an examination of the numerous natural sections where the base of the Permian sandstone is seen shows that it rests on the Silurian rocks; hence the attempts that have been made to reach coal through the Red Sandstone were simply a needless throwing away of money.

UNCONFUSED, a. *ŭn'kŏn-fūzd':* not confused or embarrassed.

UNCONFUTED, a. *ŭn'kŏn-fū'tĕd:* not confuted or overthrown. UNCONFU'TABLE, a. *-tă-bl,* incapable of being confuted.

UNCONGEALED, a. *ŭn'kŏn-jēld':* not congealed or frozen.

UNCONGENIAL, a. *ŭn'kŏn-jē'nĭ-ăl:* not congenial.

UNCONNECTED, a. *ŭn'kŏn-nĕk'tĕd:* not united; separate; loose; vague; incoherent.

UNCONNIVING, a. *ŭn'kŏn-nī'vĭng:* not conniving; not overlooking or winking at.

UNCONQUERABLE, a. *ŭn-kŏng'kĕr-ă-bl:* that cannot be overcome or subdued; invincible; insuperable. UNCON'QUERABLY, ad. UNCON'QUERED, a. not vanquished or defeated; unsubdued.

UNCONSCIENTIOUS, a. *ŭn-kŏn'shĭ-ĕn'shŭs:* not regulated or restrained by conscience.

UNCONSCIONABLE, a. *ŭn-kŏn'shŭn-ă-bl:* not guided or influenced by conscience; unreasonable. UNCON'SCIONABLY, ad. in a manner that conscience and reason do not justify.

UNCONSCIOUS, a. *ŭn-kŏn'shŭs:* not conscious; not knowing; unaware. UNCON'SCIOUSLY, ad. without knowledge or perception.

UNCONSECRATED, a. *ŭn-kŏn'sĕ-krā-tĕd:* not consecrated or set apart.

UNCONSENTING, a. *ŭn'kŏn-sĕnt'ĭng:* not yielding consent.

UNCONSIDERED, a. *ŭn'kŏn-sĭd'ĕrd:* not considered or attended to.

UNCONSOLIDATED, a. *ŭn'kŏn-sŏl'ĭ-dā-tĕd:* not consolidated; not made solid.

UNCONSTANT, a. *ŭn-kŏn'stănt:* inconstant.

UNCONSTITUTIONAL, a. *ŭn-kŏn'stĭ-tū'shŭn-ăl:* contrary to the principles of the constitution. UNCON'STITU'TIONALLY, ad. in a manner not warranted by the principles and usages of the constitution.

UNCONSTRAINED, a. *ŭn'kŏn-strānd':* free from constraint; voluntary. UN'CONSTRAIN'EDLY, ad. without force or constraint; freely. UN'CONSTRAINT', n. freedom; ease.

UNCONSUMED, a. *ŭn'kŏn-sūmd':* not consumed or expended; not wasted or dissipated.

UNCONSUMMATED, a. *ŭn-kŏn'sŭm-mā-tĕd:* not fully completed.

UNCONTAMINATED, a. *ŭn'kŏn-tăm'ĭ-nā-tĕd:* not polluted or defiled.

UNCONTEMNED, a. *ŭn'kŏn-tĕmd':* not despised.

UNCONTENDING, a. *ŭn'kŏn-tĕnd'ĭng:* not contesting.

UNCONTESTED, a. *ŭn'kŏn-tĕst'ĕd:* not contested or disputed.

UNCONTRADICTED, a. *ŭn-kŏn'tră-dĭk'tĕd:* not denied.

UNCONTRIVING, a. *ŭn'kŏn-trī'vĭng:* deficient in powers of contrivance.

UNCONTROLLABLE, a. *ŭn'kŏn-trōl'lă-bl:* that cannot be controlled; ungovernable; irresistible. UN'CONTROL'LABLY, ad. UN'CONTROLLED', a. not governed or restrained; not resisted; unopposed. UN'CONTROL'LEDLY, ad. *-lĕd-lĭ.*

UNCONTROVERTED, a. *ŭn-kŏn'trō-vĕrt'ĕd:* not controverted or disputed; not liable to be called in question.

UNCONVERSABLE, a. *ŭn'kŏn-vĕr'să-bl:* not ready in conversation; not social.

UNCONVERTED, a. *ŭn'kŏn-vĕrt'ĕd:* not changed; not changed in opinion or life. UN'CONVERTIBLE, a. that cannot be converted or changed in form.

UNCONVINCED, a. *ŭn'kŏn-vĭnst':* not persuaded or satisfied. UN'CONVIN'CING, a. without persuasive force.

UNCOOKED, a. *ŭn-kŭkt':* not cooked or dressed, as food.

UNCORK, v. *ŭn-kŏrk':* to draw the cork from.

UNCORRECTED, a. *ŭn'kŏr-rĕk'tĕd:* not corrected; not revised; not amended; not rendered exact.

UNCORROBORATED, a. *ŭn'kŏr-rŏb'ŏ-rā-tĕd:* not confirmed.

UNCORRUPT, a. *ŭn'kŏr-rŭpt':* not depraved; not tainted with wickedness. UN'CORRUP'TED, a. not vitiated; not depraved or perverted. UN'CORRUP'TIBLE, a. that cannot be corrupted. UN'CORRUPT'NESS, n. rectitude; uprightness; purity.

UNCOUNTED, a. *ŭn-kownt'ĕd:* not numbered or counted.

UNCOUPLE, v. *ŭn-kŭp'l:* to loose; to disjoin, said of dogs, railway cars, or of things generally that are coupled or joined. UNCOUP'LING, imp. UNCOUP'LED, a. set loose or free; single; not wedded.

UNCOURTEOUS, a. *ŭn-kĕr-tē-ŭs:* uncivil; unpolite. UNCOUR'TEOUSLY, ad. UNCOUR'TEOUSNESS, n. disobliging treatment; incivility. UNCOURT'LY, *-kōrt'lĭ,* a. not elegant or refined in manners, as those trained at the court of a prince; coarse; rustic.

UNCOUTH, a. *ŭn-kōth'* [AS. *un,* not, and *cuth,* known: AS. *cunnan,* to know (see CUNNING)]: strange; awkward; ungraceful; ungainly; in *OE.,* unknown. UNCOUTH'LY, ad. *-lĭ,* oddly; strangely. UNCOUTH'NESS, n. *-nĕs,* oddness; strangeness; awkwardness.—SYN. of 'uncouth': coarse; rude; clumsy; odd; ungainly; rough; gross.

UNCOVENANTED, a. *ŭn-kŭv'ĕ-nănt-ĕd:* not having joined in a league, covenant, or agreement, as in the Solemn League and Covenant of the Scottish people in the persecuting times of the Stuarts; in *theol.,* applied by some to those who have not entered into that relationship which God has been pleased, through Christ Jesus, to establish between Himself and His people, by such appointed means of grace as baptism and the Eucharist, as when a person dies unbaptized he is said to be left to the *uncovenanted* mercies of God; in the *old E. I. civil service,* applied to

that department in which no entrance examination is required, and the appointees are not subject to any formal engagement, but may resign or be dismissed at any time: see also under COVENANT.

UNCOVER, v. *ŭn-kŭv'ĕr:* to remove any covering from; to deprive of clothes; to unroof, as a building; to lay open or bare; to bare the head in token of respect. UNCOV'ERING, imp. laying open to view. UNCOV'ERED, pp. laid open to view; laid bare.

UNCREATE, v. *ŭn'krē-āt':* in *OE.*, to annihilate; to deprive of existence: ADJ. not formed or made; not produced by creation; self existent. UNCREATED, a. *ŭn'krē-ā'tĕd,* not yet created; not produced by creation.

UNCREDITED, a. *ŭn-krĕd'ĭt-ĕd:* not set to the credit of; not believed.

UNCRITICAL, a. *ŭn-krĭt'ĭ-kăl:* not critical; lacking the critical faculty; not according to the just rules of criticism.

UNCROPPED, a. *ŭn-krŏpt':* not gathered; lying in fallow.

UNCROSSED, a. *ŭn-krŏst':* not cancelled; not opposed; not thwarted.

UNCROWDED, a. *ŭn-krowd'ĕd:* not closely pressed together; not thronged.

UNCROWN, v. *ŭn-krown':* to deprive of a crown; to deprive of sovereignty. UNCROWNED', a. *-krownd',* not crowned; deprived of a crown.

UNCRYSTALLIZABLE, a. *ŭn-krĭs'tăl-lī'ză-bl:* that cannot be formed into crystals. UNCRYS'TALLIZED, a. not converted into crystals.

UNCTION, n. *ŭngk'shŭn* [F. *onction,* unction—from L. *unctĭō* or *unctĭōnem,* an anointing; *unctus,* anointed, smeared; *ungĕrĕ,* to anoint]: in *OE.*, the act of anointing; the act of rubbing or smearing with fat or fatty matter; anything softening; hence, in modern usage, that mode of address, tone of expression, or peculiar quality in the words used, which inspires the hearer with feelings of devotion, tenderness, sympathy, or the like; divine or sanctifying grace; also, contemptuously, hypocritical blandness or suavity. EXTREME UNCTION, in the *Rom. Cath. Chh.*, the sacrament or rite of anointing with consecrated oil, administered to persons at the point of death. UNC'TUOUS, a. *-tū-ŭs,* resembling oil or grease; oily; greasy; extremely bland or suave in address; in *min.*, having a greasy or soapy feel. UNC'TUOUSNESS, n. *-nĕs,* or UNC'TUOS'ITY, n. *-ŏs'ĭ-tĭ,* quality of being oily or greasy; fatness; oiliness; blandness of address.—*Unction,* the practice of anointing the body, or certain portions of the body, with oil, especially with the oil of olives, was resorted to by the ancients from motives of health (see OILS), of athletic development, or of luxury; but the practice is noticeable here chiefly in its relations to religion. Anointing with oil seems to have been supposed to carry with it the same effects in spiritual things which it produces in the natural

world. It was a rite in frequent use among the Egyptians, as well as the Greeks and Romans; and the scriptural narrative of the ante-Mosaic religion contains evidence of its use (Gen. xxviii. 18, xxxi. 13). In the Mosaic ceremonial its use is still more frequent. Priests and kings were anointed on being set apart for office; also sacred vessels. The oil employed in these anointings was prepared of the most precious perfumes and balsams, and Ezekiel rebukes the Jews (xxiii. 41) for making a similar unguent for their personal uses. The special significance of the rite may be inferred from the circumstance that the popular name of the expected Messiah was the Christos, i.e., the Anointed. In Christian use, anointing from a very early time possessed the same sacred significance (see James v. 13–18): for its ecclesiastical use, see EXTREME UNCTION. Besides the anointing of the sick, however, there are many other sacred unctions traceable in ancient Christian practice—namely, in baptism, in confirmation, in ordination of priests and other clergy, in consecration of churches and altars, benediction of sacred vessels and utensils, etc. U. has been employed also in the coronation of kings; and in some countries curious traditions and legends are preserved connected with the unction of the king, or arising out of it: see RHEIMS.

UNCULTIVATED, a. *ŭn-kŭl'tĭ-vā-tĕd:* not cultivated; not instructed; not civilized; rough in manners; wild; in a state of nature.

UNCUMBERED, a. *ŭn-kŭm'bĕrd:* not burdened; not embarrassed.

UNCURBED, a. *ŭn-kĕrbd':* not curbed or restrained; licentious. UNCUR'BABLE, a. *-kĕr'bă-bl,* that cannot be curbed.

UNCURED, a. *ŭn-kūrd':* not cured or healed.

UNCURL, v. *ŭn-kĕrl':* to loose from ringlets; to lose the curl, or become straight. UNCURLED', a. not formed into ringlets.

UNCURRENT, a. *ŭn-kŭr'rĕnt:* not current; not passing as a common coin.

UNCURSE, v. *ŭn-kĕrs':* to free from any execration. UNCURST', pp. *-kĕrst',* not execrated.

UNCURTAILED, a. *ŭn'kĕr-tāld':* not curtailed or shortened.

UNCUT, a. *ŭn-kŭt':* not cut, as a precious stone; not separated or divided by cutting, especially said of the leaves of a book that have not been cut or dressed in the binding.

UNDAMAGED, a. *ŭn-dăm'ĭjd:* not damaged, spoiled, or made worse.

UNDATED, a. *ŭn-dā'tĕd:* having no date.

UNDATED, a. *ŭn'dā-tĕd* [L. *undātus,* in the form of waves—from *unda,* a wave]: having a waved surface; in *bot.,* rising and falling in waves toward the margin, as a leaf.

UNDAUNTED, a. *ŭn-dawnt'ĕd:* not subdued or depressed by fear; intrepid. UNDAUNT'EDLY, ad. UNDAUNT'EDNESS, n. fearless bravery.—SYN. of 'undaunted': bold; fearless; brave; courageous; valiant; gallant; heroic.

UNDAZZLED, a. *ŭn-dăz'ld:* not dazzled; not dimmed or confused by splendor.

UNDEAF, v. *ŭn-dĕf':* to free from deafness.

UNDEBASED, a. *ŭn'dĕ-bāst':* not debased; not adulterated.

UNDEBAUCHED, a. *ŭn'dĕ-bawcht':* not debauched; not corrupted.

UNDECAGON, n. *ŭn-dĕk'ă-gŏn* [L. *undecim*, eleven; Gr. *gōnĭa*, an angle]: a plane figure having eleven angles or sides.

UNDECANE, n. *ŭn'dē-kān* [L. *unus;* Eng. *decane*]: in *chem.*, $C_{11}H_{24}$; one of the series of paraffins obtained from Amer. petroleum. It has a sp. gr. of ·765 at 16°, and boils at 180° to 184°.

UNDECAYED, a. *ŭn'dĕ-kād':* still in full strength; not impaired by age or accident. UN'DECAY'ING, a. not suffering diminution or decline.

UNDECEIVABLE, a. *ŭn'dĕ-sēv'ă-bl:* not subject to be imposed on or misled. UN'DECEIVE', v. to free from deception, cheat, or mistake. UN'DECEIV'ING, imp. UN'DECEIVED', pp.

UNDECIDED, a. *ŭn'dĕ-sī'dĕd:* not decided or determined; wavering; hesitating.

UNDECIPHERED, a. *ŭn'dĕ-sī'fĕrd:* not deciphered or explained. UN'DECI'PHERABLE, a. incapable of being deciphered; enigmatic.

UNDECKED, a. *ŭn-dĕkt':* not decked or adorned; not having a deck, as a ship. UNDECK', v. *-dĕk'*, in *OE.*, to deprive of ornaments.

UNDECLARED, a. *ŭn'dĕ-klārd':* not declared or avowed.

UNDECLINABLE, a. *ŭn'dĕ-klī'nă-bl:* that cannot be declined or avoided. UN'DECLINED', a. in *gram.*, not declined or varied in termination, as a noun.

UNDECOMPOSABLE, a. *ŭn'dē-kŏm-pō'ză-bl:* that cannot be resolved into its constituent elements. UN'DECOMPOSED', a. not resolved, as into constituent elements.

UNDECORATED, a. *ŭn-dĕk'ō-rā-tĕd:* not adorned or embellished; plain.

UNDECORTICATED, a. *ŭn'dĕ-kŏr'tĭ-kā-tĕd:* not freed or cleaned from bark, husks, and the like.

UNDEDICATED, a. *ŭn-dĕd'ĭ-kā-tĕd:* not dedicated or consecrated; not inscribed to a patron.

UNDEEDED, a. *ŭn-dēd'ĕd:* in *law*, not transferred by deed; in *OE.*, not signalized by a deed or action.

UNDEFACED, a. *ŭn'dĕ-fāst':* not disfigured; not deprived of its form; not obliterated; legible. UN'DEFACE'ABLE, a. that cannot be defaced or disfigured.

UNDEFENDED, a. *ŭn'dĕ-fĕnd'ĕd:* not protected; without works of defense; exposed to assault; not defended, as an action in a court of law.

UNDEFIED, a. *ŭn'dĕ-fīd':* not set at defiance; not challenged.

UNDEFILED, a. *ŭn'dĕ-fīld':* not stained; not polluted; pure; clean.

UNDEFINABLE, a. *ŭn'dĕ-fī'nă-bl:* not capable of being described or limited; indefinable. UN'DEFINED', a. not having its limits described; not described by definition or explanation.

UNDEFRAYED, a. *ŭn'dĕ-frād':* not defrayed or paid.

UNDEJECTED, a. *ŭn'dĕ-jĕk'tĕd:* not dejected; not depressed.

UNDELIBERATED, a. *ŭn'dĕ-lĭb'ĕr-ā-tĕd:* not carefully considered.

UNDELIGHTED, a. *ŭn'dĕ-līt'ĕd:* not well pleased.

UNDELIVERED, a. *ŭn'dĕ-lĭv'ĕrd:* not delivered; not communicated.

UNDEMOLISHED, a. *ŭn'dĕ-mŏl'ĭsht:* not demolished, pulled down, or destroyed.

UNDEMONSTRABLE, a. *ŭn'dĕ-mŏn'stră-bl:* not capable of demonstration. UN'DEMON'STRATIVE, a. not demonstrative; not free or communicative; reserved in manner. UNDEM'ONSTRATED, a. not proved.

UNDENIABLE, a. *ŭn'dĕ-nī'ă-bl:* that cannot be denied or contradicted; unquestionable; indisputable; positive; certain. UN'DENI'ABLY, ad.

UNDEPLORED, a. *ŭn'dĕ-plōrd':* not deplored or lamented.

UNDEPRAVED, a. *ŭn'dĕ-prāvd':* not corrupted or vitiated.

UNDEPRECIATED, a. *ŭn'dĕ-prē'shĭ-ā-tĕd:* not lowered in value.

UNDEPRIVED, a. *ŭn'dĕ-prīvd':* not deprived; not divested of by authority.

UNDER, prep. *ŭn'dĕr* [Dan. and Sw. *under;* Dut. *onder;* Icel. *undir;* Goth. *undar;* Ger. *unter*, under: allied to Skr. *antar;* L. *inter*, among, within]: beneath or below, expressing position with reference to something over or above, or which surmounts or towers aloft, as *under* the sun, the surface, the skin, a bushel, etc.; in a position or at a point inferior to or lower than; subordinate to; in a state of subjection to; subject to, as *under* certain conditions; in accordance with, as *under* the rule; in course of, as the question is *under* consideration; less than, as he is still *under* age; attested by, as *under* his own hand: AD. in a lower or subordinate condition; in subjection: ADJ. lower in position, rank, or degree; subordinate. TO KNOCK UNDER, to yield; to submit. UNDER ARMS, in *mil.*, fully equipped for action. UNDER FIRE, exposed to an enemy's shot. UNDERGROUND, below the surface of the ground. UNDER SAIL, among *seamen*, moved by sails; using sails—applied to a

ship when sailing, as distinguished from steaming. UNDER SENTENCE, condemned. UNDER THE LEE, to the leeward —that is, the sheltered side (see LEE). UNDER THE ROSE, in confidence; privately; secretly. UNDER WAY, in progress; moving—applied to the sailing of a ship; having started. TO KEEP UNDER, to hold in subjection.—The prep. *under* frequently coalesces with its noun to form adverbs and adjectives, as *underground, underfoot, underhand,* etc. *Note.*—All the possible compounds of *under* are not given in the vocabulary, but only those which are most likely to need explanation. Compounds of *under* not given may be found by consulting the cyclopedia for the separate parts. *Under* is not usually separated by a hyphen, and is sometimes prepositional, as *under*ground, and sometimes adverbial, as *under*done.

UNDERAGENT, n. *ŭn'dĕr-ā'jĕnt:* an inferior agent.

UNDERBEAR, v. *ŭn'dĕr-bär':* in *OE.*, to support; to endure; to line, as a dress. UNDERBORNE', pp. *-born'*. UNDERBEAR'ING, imp.: N. in *OE.*, the act of supporting. UNDERBEAR'ER, n. *-bär'ĕr*, one who supports or bears up a weight, as a coffin at a funeral.

UNDERBID, v. *ŭn'dĕr-bĭd':* to bid less than the value, or than is offered by another. UN'DERBID'DING, imp.

UNDERBRED, a. *ŭn'dĕr-brĕd:* of inferior breeding or manners; coarse; vulgar.

UNDERCLAY, n. *ŭn'dĕr-klā:* in *geol.*, those beds of clay which immediately underlie seams of coal, and which seem to have formed the ancient soil or mud on which the vegetation of the coal-bed flourished.

UNDERCLERK, n. *ŭn'dĕr-klĕrk:* a junior clerk.

UNDERCLIFF, n. *ŭn'dĕr-klĭf:* in *geol.*, a subordinate terrace or cliff between the sea and the original cliff, by the falling down of the upper part of the latter.

UNDERCOAT, n. *ŭn'dĕr-kōt:* a coat worn beneath a greatcoat or other coat.

UNDERCROFT, n. *ŭn'dĕr-krŏft* [*under*, and prov. Eng. *croft* for *crypt*, a vault (see CRYPT)]: a vault under the choir or chancel of a cathedral or other church; any secret walk or vault under ground.

UNDERCURRENT, n. *ŭn'dĕr-kŭr-rĕnt:* a current below the surface of the water; hence, something active but not visible, said of a sentiment or tendency—as, an *undercurrent* of socialism.

UNDERDONE, a. *ŭn'dĕr-dŭn':* done or cooked less than is requisite or usual.

UNDERDRAIN, n. *ŭn'dĕr-drān:* a drain or trench below the surface: V. *ŭn'dĕr-drān'*, to drain by cutting a channel below the surface of the ground. UN'DERDRAINED', pp. drained by cutting a channel below the surface.

UNDERFONG, v. *ŭn'dĕr-fŏng'* [*under*, and AS. *fongen*, taken—from *fon*, to take, to seize (see FANG)]: in *OE.*, to take in hand; to undertake; to deceive; to ensnare.

UNDERFOOT, ad. *ŭn'dĕr-fŭt:* under the feet; beneath: ADJ. servile; base; also applied to a kind of granite paving.

UNDERGIRD, v. *ŭn'dĕr-gĕrd';* to bind below; to gird round the bottom: see also FRAP.

UNDERGO, v. *ŭn'dĕr-gō':* to endure something burdensome; to suffer; to sustain without sinking or yielding; to undertake; to hazard; to be subject to; be subjected to; experience; to underlie; to possess. UN'DERGO'ING, imp. UN'DERWENT', pt. *-wĕnt'*. UN'DERGONE', pp. *-gŏn'*, borne; sustained; endured.

UNDERGRADUATE, n. *ŭn'dĕr-grăd'ū-āt:* a member or student of a university who has not taken his first degree. UN'DERGRAD'UATESHIP, n. the office or condition of an undergraduate.

UNDERGROUND, n. *ŭn'dĕr-grownd:* a space beneath the surface of the ground; AD. or ADJ. beneath the surface of the earth, as *underground* railways.

UNDERGROWTH, n. *ŭn'dĕr-grōth:* that which grows under trees.

UNDERHAND, a. *ŭn'dĕr-hănd:* secret; done by meanness or fraud; clandestine: AD. by meanness and fraud; by secret means.

UNDERHILL, *ŭn'dĕr-hĭl,* JOHN: colonist: d. about 1672; b. Warwickshire, England. He rendered army service in the Netherlands and at Cadiz; came to America 1630; became a representative of Boston in the assembly; commanded the colonial troops which defeated the Pequot Indians 1637; was banished because of his religious views; returned and was appointed gov. of Exeter and Dover, N. H., 1641; removed to Flushing, L. I., 1646; and was an officer in the war between the Dutch and the Indians. He received a tract of 150 acres from the Mantinenoc Indians on Long Island 1667. He died at Oyster Bay.

UNDERHUNG, a. *ŭn-dĕr-hŭng':* projecting, as applied to the lower jaw.

UNDERIVED, a. *ŭn-dĕ-rīvd':* not borrowed; not received from a foreign source.

UNDER-KEEPER, n. *ŭn'dĕr-kēp'ĕr:* a subordinate keeper.

UNDERLAY, v. *ŭn'dĕr-lā':* to lay or place under or beneath; to support by something laid under: N. same as UNDERLIE (q.v.). UN'DERLAY'ING, imp. UN'DERLAID', pp.

UNDER-LEASE, in Law: alienation by a lessee of part of his lease. Even an alienation of the whole lease, with reservation of the rent, has been regarded as an U.-L. When a lessee transfers all his interest in the lease, the act is an assignment, not an U.-L. The tenant in occupation by virtue of U.-L. has the same rights as the first lessee, and no more.

UNDERLET, v. *ŭn'dĕr-lĕt':* to sublet; to let below the value.

UNDERLIE, v. *ŭn'dėr-lī':* to lie beneath, as a support, to be liable to, as a challenge: N. in *mining*, the dip or inclination of a mineral vein viewed from above downward; also UNDERLAY, n.

UNDERLINE, v. *ŭn'dėr-līn':* to draw a line under; to mark with a line below the word or words. UN'DERLINED', pp. marked with a line underneath.

UNDERLING, n. *ŭn'dėr-lĭng* [dim. of *under*]: an inferior person or agent; a mere subordinate; a mean fellow.

UNDERMINE, v. *ŭn'dėr-mīn':* to form a mine under; excavate beneath, as earth or rock, for the purpose of creating a fall, or of blowing up the mass; to remove the foundation or support of anything; to injure by secret and dishonorable means. UN'DERMI'NING, imp. UN'DERMINED', pp. UN'DERMI'NER, n. one who undermines; one who subverts by secret or dishonorable means.

UNDERMOST, a. *ŭn'dėr-mōst:* lowest in place or condition.

UNDERN, n. *ŭn'dėrn* [AS.—from *under*, which see]: in *OE.*, the third hour of the day, that is, 9 o'clock A.M.; or from 9 o'clock to noon (see TERCE); in *prov. Eng.*, the afternoon.

UNDERNEATH, ad. *ŭn-dėr-nēth'* [AS. *underneothan*, underneath—from *under*, under, and *neothan*, beneath]: below; in a lower place: PREP. beneath; below.

UNDERPAY, v. *ŭn'dėr-pā':* to pay at too small a rate; to pay too little.

UNDERPIN, v. *ŭn'dėr-pĭn':* to lay stones under, as a building, or wall on which it is to rest; to prop; to support by some solid foundation. UN'DERPIN'NING, n. the act of one who underpins; the stones on which a building immediately rests; the foundation-wall of a building.

UNDERPLOT, n. *ŭn'dėr-plŏt:* a series of events in a play proceeding collaterally with the main story; a subordinate plot; a clandestine scheme.

UNDERPROP, v. *ŭn'dėr-prŏp':* to support; to uphold.

UNDERRATE, v. *ŭn'dėr-rāt':* to rate below the value. UN'DERRA'TED, a. pp. valued too low.

UNDERRUN, v. *ŭn'dėr-rŭn':* among *seamen*, to pass a boat or ship along or under a cable or rope—the cable being raised and passed over the bows and stern, the men hauling the boat along by pulling upon the cable.

UNDERSAY, v. *ŭn'dėr-sā':* in *OE.*, to say in a slighting way, or by way of contradiction.

UNDER-SECRETARY, n. *ŭn'dėr-sĕk'rĕ-tā'rĭ;* an assistant secretary.

UNDERSELL, v. *ŭn'dėr-sĕl':* to sell at a lower price than.

UNDER-SERVANT, n. *ŭn'dėr-sėr'vănt:* a servant subordinate to another or others.

UNDERSETTER, n. *ŭn'dėr-sĕt'tėr* [*under*, and AS. *settan*, to place]: in *OE.*, a support; a prop; a pedestal.

UNDER-SHERIFF, n. *ŭn'dĕr-shĕr'ĭf:* a sheriff acting under a superior; a deputy-sheriff.

UNDERSHOT, a. *ŭn'dĕr-shŏt:* moved by water passing under or acting on the underpart, as the wheel of a mill.

UNDERSHRUB, n. *ŭn'dĕr-shrŭb:* in *bot.*, a woody plant of small size, the ends of whose branches perish every year.

UNDERSIGN, v. *ŭn'dĕr-sīn':* to write one's name at the foot. UN'DERSIGNED', a. subscribed at the bottom or end of a writing: N. the person or persons who subscribe their names to any document.

UNDERSIZED, a. *ŭn'dĕr-sīzd:* of a size less than the common; stunted.

UNDERSOIL, n. *ŭn'dĕr-soyl:* subsoil.

UNDERSONG, n. *ŭn'dĕr-sŏng:* the chorus or burden of a song.

UNDERSTAND, v. *ŭn'dĕr-stănd'* [*under*, and *stand:* AS. *understandan*, to understand]: to comprehend fully; to have just and adequate ideas of; to perceive; to discern; to know the meaning of; to know without expressing; to know what is not expressed; to infer; to be informed by another; to learn. UN'DERSTAND'ING, imp.: ADJ. knowing; skilful; intelligent: N. that power of the mind by which it is enabled to receive or comprehend the real state of things presented to it, or that by which men derive ideas from sensations; the faculty of reflection and generalization; among *German metaphysicians*, the faculty of the mind which deals with real, practical, and material knowledge and the adaptation of means to ends, and which is distinguished from *reason—understanding* discerning relations only, while *reason* discerns truth itself; intellect; comprehension; conception; intelligence; discernment; wisdom; terms of communication. UN'DERSTOOD', pt. pp. UN'DERSTAND'ED, pp. *-stănd'ĕd*, OE. and *familiarly*, for UNDERSTOOD; known as to meaning or import.

UNDERSTATE, v. *ŭn'dĕr-stāt':* to represent less strongly than the truth will bear; to state too low.

UNDERSTRAPPER, n. *ŭn'dĕr-străp'pĕr:* an inferior agent; a petty fellow.

UNDERSTUDY, n. *ŭn'dĕr-stŭd'ĭ* [prefix *under;* Eng. *study*]: an actor or actress who studies a part allotted to another performer, so as to be ready to undertake it in case of necessity.

UNDERTAKE, v. *ŭn'dĕr-tāk':* to engage in; to enter upon; to take in hand; to take upon one's self; to covenant; to stand bound; to promise; in *OE.*, to assume a character; to engage with; to have the charge of; to venture; to hazard. UN'DERTA'KING, imp. engaging in; beginning to perform: N. any business or project which a person engages to perform; an enterprise; an engagement; undertaker's business. UN'DERTOOK', pt. did undertake. UN'DERTA'KEN, pp. UN'DERTA'KER, n. one who engages in any business or project; one who makes or supplies coffins, prepares the dead for burial, and manages funerals.

UNDER-TENANT, n. *ŭn'dĕr-tĕn'ănt:* one who holds from a tenant and not from the proprietor.

UNDERTIME, n. *ŭn'dĕr-tīm:* in *OE.*, same as *Undern* (q.v.).

UNDERTONE, n. *ŭn'dĕr-tōn:* a lower manner of speaking than usual; a low or subdued tone.

UNDERTOW, n. *ŭn'dĕr-tō:* a nautical term for any decided undercurrent of water, opposite to that of the surface; the backward flow of a wave that breaks on a beach.

UNDERVALUE, v. *ŭn'dĕr-văl'ū:* to value or estimate below the real worth; to rate too low; to esteem lightly; to hold in mean estimation; to despise. UN'DERVAL'UING, imp. UN'DERVAL'UED, pp. UN'DERVAL'UA'TION, n. a value or estimate below the real worth.

UNDERWENT: pt. of the verb UNDERGO (q.v.).

UNDERWOOD, n. *ŭn'dĕr-wŏŏd:* small trees and bushes growing among large trees; coppice.

UNDERWOOD, *ŭn'dĕr-wŏŏd,* ADIN BALLOU: lawyer: 1828, May 19—1888, Jan. 14; b. Milford, Mass He graduated at Brown Univ. 1849; was admitted to the bar 1853; and practiced in Boston till the beginning of the civil war. He entered the Union army as capt. of vols. 1861; was commissioned col. 1863, Apr., and brig.gen. Nov. 6; and was brevetted maj.gen. of vols. 1865, Aug. 13. A wound received while leading a charge to relieve the beleaguered army at Chattanooga 1863, Oct. 28, incapacitated him for service for more than a year. He was surveyor of the port of Boston 1865, Aug. 20—1886, July. He published *History of the Thirty-third Massachusetts Regiment* (Boston 1881).

UNDERWORK, v. *ŭn'dĕr-wĕrk':* to attempt to destroy or injure by clandestine measures; to work at a less price than others; to expend too little work on: N. *-wĕrk,* subordinate work; petty affairs. UN'DERWROUGHT', pt. pp.

UNDERWRITE, v. *ŭn'dĕr-rīt':* to subscribe, as one's name to a policy of insurance; to practice insuring. UN'DERWRI'TING, imp.: N. act or practice of insuring ships, goods, etc. (see INSURANCE). UN'DERWRI'TER, n. one who insures ships, goods, etc., for a certain amount in case of loss or damage, by subscribing his name to a formal document, called a policy, in consideration of a certain sum per cent. UN'DERWRIT'TEN, pp.

UNDESCRIBED, a. *ŭn'dĕ-skrībd':* not represented or set forth. UN'DESCRI'BABLE, a. that cannot be described or represented in words.

UNDESERVED, a. *ŭn'dĕ-zĕrvd':* not merited. UN'DESER'VEDLY, ad. without desert, either good or evil. UN'DESER'VEDNESS, n. the state or quality of being undeserved. UN'DESER'VER, n. *-vĕr,* in *OE.*, one of no merit. UN'DESER'VING, a. not having merit; not having worth. UN'DESER'VINGLY, ad.

UNDESIGNATED, a. *ŭn-dĕs'ĭg-nā-tĕd:* not designated, marked out, or indicated.

UNDESIGNED, a. *ŭn'dĕ-zīnd':* not intended; not proceeding from purpose; unintentional. UN DESIGN'EDLY, ad. UN'DESIGN'ING, a. not acting with set purpose; upright; having no artful purpose.

UNDESIRABLE, a. *ŭn'dĕ zī'rā-bl:* not to be wished; that does not please. UN'DESIRED', a. *-zīrd'*, not desired; not solicited. UN'DESI'RING, a. not wishing. UN'DESI'ROUS, a. *-zī'rŭs*, not eager to obtain.

UNDETECTED, a. *ŭn'dĕ-tĕk'tĕd:* not discovered; not laid open.

UNDETERMINED, a. *ŭn'dĕ-tĕr'mĭnd:* not settled or fixed on; undecided.

UNDETERRED, a. *ŭn'dĕ-tĕrd':* not deterred or restrained by fear or obstacles.

UNDEVIATING, a. *ŭn-dē'vĭ-ā-tĭng:* not departing from the way or from principle; steady; regular; unerring. UNDE'VIATINGLY, ad.

UNDEVISED, a. *ŭn'dĕ-vīzd:* not devised or bequeathed.

UNDEVOUT, a. *ŭn'dĕ-vowt':* not devout; without devotion.

UNDID, v. *ŭn-dĭd':* pt. of the verb UNDO (q.v.).

UNDIGESTED, a. *ŭn'dĭ-jĕs'tĕd:* not digested; not dissolved in the stomach, as food.

UNDIGHT, v. *ŭn-dīt'* [*un*, the opposite; AS. *dihtan*, to set in order, to arrange; Ger. *dichten*, to compose]: in *OE.*, to put off, as a part of dress or a personal ornament.

UNDIGNIFIED, a. *ŭn-dĭg'nĭ-fīd:* not marked or not consistent with dignity.

UNDILUTED, a. *ŭn'dĭ-lō'tĕd:* not rendered more fluid; not weakened in strength.

UNDIMINISHABLE, a. *ŭn'dĭ-mĭn'ĭsh-ā-bl:* not capable of being made less or smaller. UN'DIMIN'ISHED, a. not lessened; not impaired. UN'DIMIN'ISHING, a. not becoming less.

UNDIMMED, a. *ŭn-dĭmd':* not dimmed or obscured.

UNDINE, *ŭn-dēn'* or *ŭn'dēn* [perhaps from *unda*, a wave]: a water-spirit of the female sex. Among all the different orders of elementary spirits, according to Paracelsus, Undines intermarry most readily with human beings, and the U. who gives birth to a child under such a union receives with her babe a human soul. But the man who takes an U. to wife must be careful not to go on the water with her, or at least not to anger her while there, for in that case she will return to her original element. Should this happen, the U. is not disposed to consider her marriage dissolved, but will seek to destroy her husband should he venture on a second marriage. Baron de la Motte Fouqué has made this Paracelsist fancy the basis of his exquisite tale *Undine.*

UNDINTED, a. *ŭn-dĭn'tĕd:* not impressed or hollowed by a blow.

UNDIPLOMATIC, a. *ŭn-dĭp'lō-măt'ĭk:* not according to diplomatic rules; impolitic.

UNDIRECTED, a. *ŭn'dĭ-rĕk'tĕd:* not guided or instructed; not addressed, as a letter.

UNDISCERNED, a. *ŭn'dĭs-zêrnd':* not discerned or perceived; not seen or observed; not discovered. UN'DISCERN'IBLE, a. that cannot be discerned; invisible. UN'DISCERN'ING, a. not capable of seeing or discriminating; lacking judgment or the power of discrimination; injudicious.

UNDISCHARGED, a. *ŭn'dĭs-chârgd':* not discharged; not freed from any load, burden, or obligation.

UNDISCIPLINED, a. *ŭn-dĭs'sĭ-plĭnd:* not duly exercised and taught; raw; not instructed; not subdued.

UNDISCLOSED, a. *ŭn'dĭs-klōzd':* not disclosed or revealed; not unfolded.

UNDISCOVERABLE, a. *ŭn'dĭs-kŭv'ĕr-ă-bl:* that cannot be found out; that cannot be brought to light. UN'DISCOV'ERED, a. not brought to light; not yet found out.

UNDISCRIMINATING, a. *ŭn'dĭs-krĭm'ĭ-nā-tĭng:* not discriminating.

UNDISGUISED, a. *ŭn'dĭs-gīzd':* not disguised or covered with a mask; open; candid; frank; simple.

UNDISHONORED, a. *ŭn'dĭs-ŏn'ĕrd:* not disgraced.

UNDISMAYED, a. *ŭn'dĭs-mād':* not dismayed or disheartened by fear; not discouraged.

UNDISPOSED, a. *ŭn'dĭs-pōzd':* indisposed; not sold, settled, arranged, or arranged for—always with *of.*

UNDISPUTED, a. *ŭn'dĭs-pū'tĕd:* not disputed or contested; not called in question. UN'DISPU'TEDLY, ad. without question or dispute.

UNDISSEMBLED, a. *ŭn'dĭs-sĕm'bld:* open; undisguised. UN'DISSEM'BLING, a. not exhibiting a false appearance; truthful.

UNDISSIPATED, a. *ŭn-dĭs'sĭ-pā-tĕd:* not scattered; not dispersed.

UNDISSOLVABLE, a. *ŭn'dĭz-zŏl'vă-bl:* that cannot be dissolved or melted; that cannot be loosened. UN'DISSOLVED', a. not dissolved; not melted; not broken; intact. UN'DISSOLV'ING, a. not melting.

UNDISTENDED, a. *ŭn'dĭs-tĕnd'ĕd:* not enlarged.

UNDISTILLED, a. *ŭn'dĭs-tĭld':* not distilled; having the spirit or essence still unextracted.

UNDISTINGUISHABLE, a. *ŭn'dĭs-tĭng'gŭĭsh-ă-bl:* that cannot be distinctly seen; indistinguishable. UN'DISTIN'GUISHABLY, ad. UN'DISTIN'GUISHED, a. not so marked as to be distinctly known; not plainly discerned; not marked by any particular property; not eminent; not treated with any particular respect. UN'DISTIN'GUISHING, a. making no difference; not discriminating.

UNDISTRACTED, a. *ŭn'dĭs-trăk'tĕd:* not distracted; not perplexed by being drawn toward a variety of objects.

UNDISTURBED, a. *ŭn'dĭs-tĕrbd':* free from interruption; unmolested; serene; tranquil; not agitated, as water. UN'DISTURB'ING, a. not molesting.

UNDIVERSIFIED, a. *ŭn'dĭ-vĕr'sĭ-fīd:* not varied; uniform.

UNDIVERTED, a. *ŭn'dĭ-vĕr'tĕd:* not turned aside; not amused.

UNDIVIDABLE, a. *ŭn'dĭ-vī'dă bl:* that cannot be separated into parts; indivisible. UN'DIVI DED, a. not separated; not separated into parts; unbroken; whole. UN'DIVI'DEDLY, ad. so as not to be parted.

UNDIVULGED, a. *ŭn'dĭ-vŭljd':* not revealed or disclosed; kept secret.

UNDO, v. *ŭn-dō':* to reverse what has been done; to annul; to loose; to untie; to unfasten; to unravel; to open; to ruin. UNDO'ING, imp.: N. the reversing of what has been done; ruin. UNDID', pt. UNDONE', pp. annulled; destroyed; ruined, as, he has *undone* all my work: ADJ. not performed; not executed, as, he has left his own work *undone.* UNDO'ER, n. one who undoes; one who destroys.

UNDOCK, v. *ŭn-dŏk':* to take out of dock.

UNDOMESTICATED, a. *ŭn'dō-mĕs'tĭ-kā-tĕd:* not accustomed to a family life; not tamed.

UNDOUBTED, a. *ŭn-dowt'ĕd:* not called in question, admitting no doubt; indisputable; not subjected to suspicion. UNDOUBT'EDLY, ad. without question. UNDOUBT'ING, a. not hesitating respecting the truth; admitting no doubt; not fluctuating in uncertainty; not wavering. UNDOUBT'INGLY, ad. UNDOUBT'FUL, a. *-fŭl,* not doubtful; plain; evident.

UNDRAPED, a. *ŭn-drāpt':* not covered with drapery; nude.

UNDRAWN, a. *ŭn-drawn':* not pulled by any external force; not allured; not drawn, as liquor from a cask, or a ticket in a lottery; not portrayed.

UNDREAMED, a. *ŭn-drēmd',* or UNDREAMT', a. *-drĕmt':* not thought of; not dreamed of.

UNDRESS, v. *ŭn drĕs':* to divest of clothes; to strip. UN'DRESS, n. a loose informal dress; not the dress usually and formally worn; ordinary dress, as opposed to 'full dress.' UNDRESS'ING, imp. UNDRESSED', pp.: ADJ. not dressed; not attired; not trimmed; not cooked; not put in order.

UNDRILLED, a. *ŭn-drĭld':* not taught and trained by frequent exercise.

UNDUE, a. *ŭn-dū':* that cannot yet be demanded by right; not legal; improper; excessive; not agreeable to any rule or standard. UNDU'LY, ad. not according to duty or propriety; not in proper proportion; excessively.

UNDULATE, v. *ŭn'dū-lāt* [L. *undŭlātus*, diversified as with waves—from *unda*, a wave]: to have a wavy motion; to rise up and down, as waves; to move or play, as curls or waves; to cause to vibrate; to vibrate. UN'DULATING, imp. *-lā-tĭng*, waving: ADJ. wavy; rising and falling, as waves; having a waved surface, as land. UN'DULA'TINGLY, ad. *-lĭ*. UN'DULATED, a. having a waved or ridged surface, as a tract of country. UN DULA'TION, n. *-lā'shŭn*, a waving motion or vibration; a wavy appearance; alternate elevations and depressions of surface. UN'DULA'TORY, a. *-tĕr-ĭ*, resembling the rising and falling motion of waves.

UN'DULATORY THEORY OF LIGHT: the theory that light is due to undulating motion in an ethereal medium. Optics (q.v.) ranks next to Dynamics in the category of nearly *exact* sciences—that is, of sciences whose fundamental principles are so well known that the result of almost any new experimental combination can be predicted mathematically. Given the forces acting on a body, the Laws of Motion (q.v.) enable us, by purely mathematical processes, to determine the consequent motion. The science of Optics awaits, for its full attainment of exactness, some great step in molecular physics which may give us the clue to the nature of the minute motions on which Light, Heat, Electric Currents, and Magnetism depend. In our ignorance of the ultimate nature of matter, we are unable to apply mathematical reasoning with perfect correctness and comprehensiveness.

Optics is divided into two parts, *Physical* and *Geometrical*. Of these, the latter contents itself with assuming certain obvious experimental truths, such as the fact that light in a uniform medium moves in straight lines, the ordinary laws of reflection and refraction, etc., and, making these its basis, employs mathematics to develop their further consequences. It is thus that theory has shown how to carry to their utmost perfection such exquisite specimens of art as the best telescopes and microscopes of the present day. But these investigations, and their practical application, are wholly independent of the *nature* of light, and cannot be affected by discoveries in that direction.

It is otherwise when we come to Physical Optics. This commences with the question: '*What is light?*' and endeavors to deduce from the nature of light the experimental laws which, as we have seen, are assumed as the basis of Geometrical Optics.

By two perfectly distinct classes of astronomical observations—Aberration (q.v.) and the Eclipses of Jupiter's satellites—we know that light takes *time* to pass from one body to another—the velocity, however, being enormous—about 200,000 m. per second. Hence it follows that either *Matter* (q.v.) or *Energy* (see FORCE) must be transferred from a body to the eye before we can see it. Here we have at once the rival physical theories of light, which have alternately had the advantage of one another in explaining observed phenomena. It is only of late years that an *experimentum crucis* has decided between them—

by showing one of them to be utterly incompatible with a result of observation.

Newton adopted the corpuscular theory, in which light is supposed to consist of material particles—i.e., he adopted the first of the two possible hypotheses; and he gave the first instance of the solution of a problem involving molecular forces by deducing from this theory the laws of reflection and single refraction. We shall see immediately that this beautiful investigation led to the destruction of the theory from which it was deduced. But, independent of this, there are many grave and obvious objections to the corpuscular theory; for it involves essentially the supposition of material particles impinging on the eye with the astounding velocity of 200,000 m. per second! If such particles weighed but the millionth of a pound, each would have something like ten times the Momentum (q.v.) (i.e., the battering power) and *six million* times the Vis-viva (see WORK), or kinetic energy (i.e., the penetrating power), of a rifle-bullet. Suppose them a million times smaller—yet as millions of millions of them must be supposed to enter the eye at once, coming from every point of the surface of every visible object, it seems impossible to reconcile such a hypothesis with the excessive delicacy of the organs of vision.

It is not pretended by the advocates of the rival hypothesis, the Undulatory Theory of Light, that they understand exactly the nature of the transference of energy on which they suppose light to depend; but they take from the analogy of sound in air, and of waves in water, the idea of the existence in all space of a highly elastic fluid (or quasi-solid), provisionally named the *Ether* (q.v.), and they suppose light to consist in the propagation of waves in this fluid. Huyghens has the credit of having propounded and ably developed and illustrated this theory.

As we have seen above, the general decision of investigators is that no third hypothesis as to the nature of light is admissible. Many strong arguments against the truth of the corpuscular theory had been furnished by experiment, especially in the early part of the 19th c.; and as they were always met by further and more extraordinary properties which had to be attributed to the luminous corpuscles, the theory had become fearfully complicated; and this of itself was an almost complete disproof. Still, it held its ground; for Newton's old objection to the rival theory—viz., that on the undulatory hypothesis there should be no shadows at all (witness the analogy of sounds heard round a corner)—remained unanswered. This difficulty was overcome by Young (q.v.), to whose sagacity we are indebted for the idea of *Interference* (q.v.), which completely explained the apparent discrepancy. But the question between the rival theories was finally settled by Fizeau and Foucault, who, by processes entirely different, but agreeing in their results, determined the velocity of light in air and in water.

Now, Newton had shown that refraction, such as that of light by water, if predicated of moving *particles*, re-

quires that they should move faster in water than in air. Huyghens, again, had shown that, if such refraction be predicated of *waves*, they must move slower in water than in air. Fizeau and Foucault found, by direct measurement, that light moves slower in water than in air. Hence it is certain that *light consists in the transference of energy, not of matter;* and the Undulatory Theory is based on this fact.

But, as to the manner in which energy is thus transferred, we are entirely ignorant. The common assumption is, that waves of distortion are propagated in the ether: for the nature of this motion, see WAVE. But many other modes have been suggested, one of the most notable of which is that of Rankine. Here the particles of ether are not supposed to be *displaced*, but each is merely made to turn about an axis as the wave of light passes it; the particles having Polarity (q.v.), by virtue of which they arrange themselves in similar positions when no light is passing, and by which, also, any rotation of one particle produces a consequent rotation of those in its neighborhood. For explanation of most of the common phenomena of optics, it is quite indifferent which of these assumptions we make, and, indeed, theory has not yet been carried far enough to enable us to devise experimental methods of testing which is the more likely to represent the fact in nature. It cannot be too strongly insisted on that all at present known is, that light certainly depends on the transference of energy from one part of the luminiferous medium to another; what kind of energy is transferred, vibratory or oscillatory motion, or rotation, etc., is a problem which may possibly forever remain unsolved. But vibratory wave-motion being that with which we are most familiar, as in earthquakes, sound, waves in water, etc., we naturally choose this as the most easily intelligible basis of explanation and illustration. And we shall now briefly show how the laws of linear propagation, reflection, single refraction, interference, diffraction, dispersion, polarization, and double refraction may be accounted for.

We assume, then, that light consists in a succession of waves, and for our earlier inquiries it does not matter whether they be (like those of sound) waves of condensation and rarefaction, in which the vibrations take place *in* the direction of the ray, or (like those in water) waves of distortion or displacement without condensation, in which case the luminous vibrations must be assumed to take place in some direction *perpendicular* to the ray. The phenomena of polarization and double refraction show us that the former of these hypotheses is untenable.

Propagation of Light in a Uniform Isotropic Medium. (An isotropic medium is such that if a cubical portion be taken, it possesses precisely the same properties whatever be the directions of its sides. Glass and water are isotropic, rock-salt and ice are not.)—Suppose AB (fig. 1) to represent at any time the *front* of a plane wave which is passing in the direction CD—i.e., suppose all particles of the ether in the plane AB (perpendicular to the plane of the paper)

to be similarly and equally displaced. According to Huyghens, we must suppose every particle, P, to be itself the source of a wave, which, from the uniformity of the medium, will spread with the same velocity in all directions. With centre P, and radius the space which light passes over in any assigned interval t, describe a sphere represented in section by a circle in the figure. Do the same for adjacent points, P_1, P_2, etc. Let p_1 be the intersection of the circles whose centres are P and P_1, p_2 that of the circles whose centres are P_1 and P_2, and so on. Then, as p_1 is *equidistant* from P and P_1 and (approximately) from all points of a small circular space between P and P_1 on the wave-front AB, all the separate wave-disturbances coming from these points to p_1 will be in the same *phase* (see WAVE), and will therefore combine so as to strengthen each other; while in other directions they will be in different phases, and combine to destroy each other. The locus of all such points as p_1, p_2, etc., will therefore, at the end of the time t, contain all particles of the ether equally and

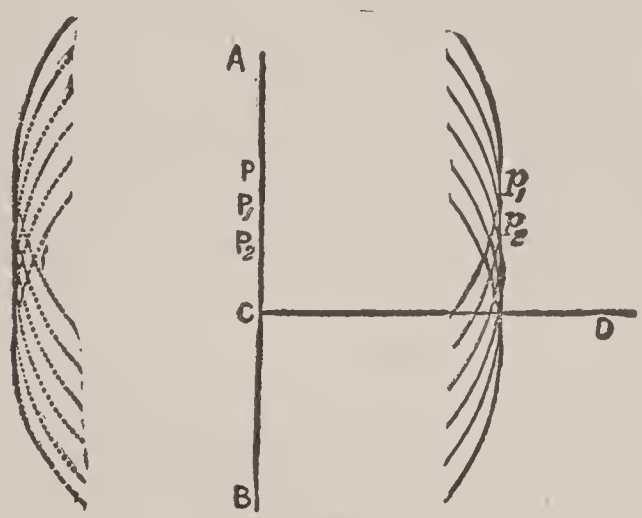


Fig. 1.

similarly disturbed, and will thus be the new wave-front. But it is obviously a plane parallel to AB. Also the disturbance at P has passed to p_1; and, when the distance PP_1 is taken as very small, Pp_1 is perpendicular to the wave-front AB. Hence, in such a medium, a plane wave remains plane, and moves with uniform velocity in a direction perpendicular to its front. [There is a difficulty as to what becomes of the disturbance, which, according to Huyghens's assumption, ought to travel *back* into the dotted portions of the spheres; and it is not easy to account for the absence of this on mechanical principles. But we are content here to take for granted that no waves are propagated backward from the main wave, as a fact clearly proved by experiment.] Since a small portion of the surface of any curved wave may be considered as plane, we now see how any such wave will be propagated in an isotropic medium. Erecting perpendiculars at every point of the surface of the curved wave, and laying off along these lines the space which light passes over in a given interval,

the extremities form a new surface, which is the wave-front after the lapse of that interval.

Reflection at a Plane Surface.—Suppose AB (fig. 2) to be a plane wave-front, moving in the direction B*b* perpen-

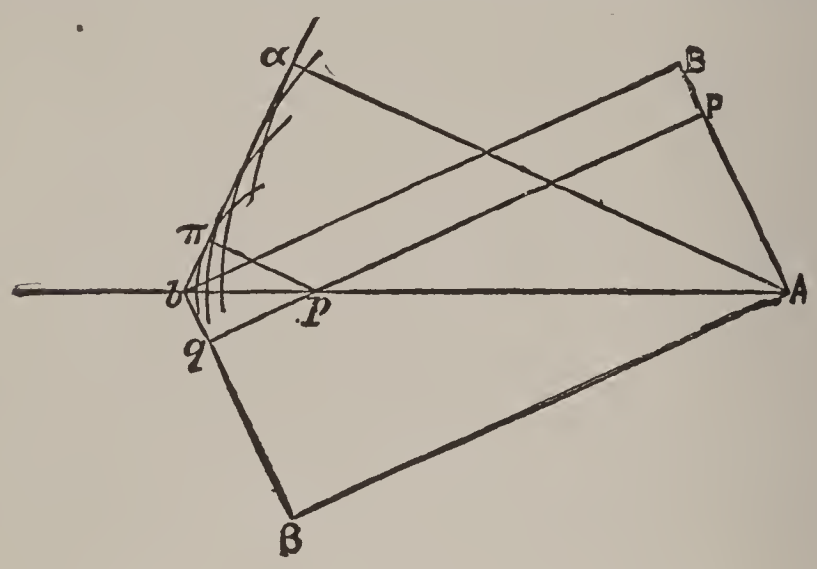


Fig. 2.

dicular to AB. Let A*b* be the reflecting surface, and let the intersection of the plane of the wave-front with the reflecting surface be a line through A perpendicular to the paper. When B has arrived at *b*, A would have arrived at *β*, and P at *q* (where *bβ* is parallel to BA, and P*q* and A*β* to B*b*), had it not been for the reflecting surface.

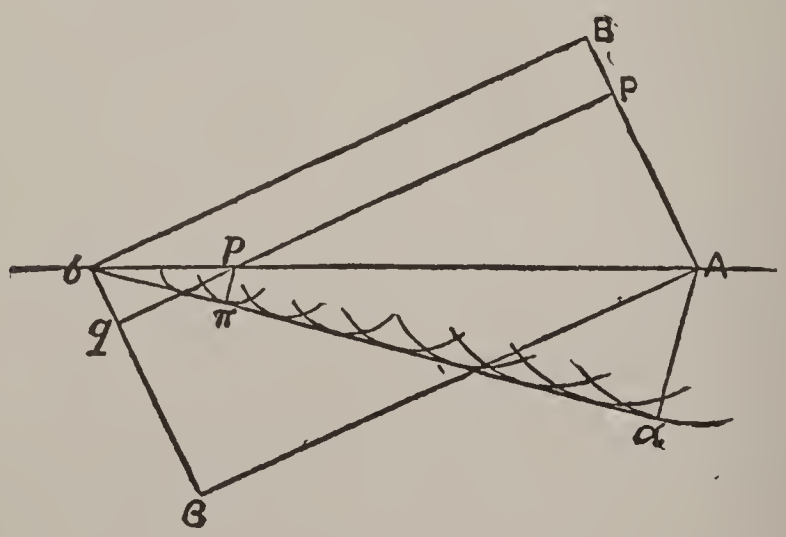


Fig. 3.

Hence, when B is at *b*, A has diverged into a sphere of radius A*β*, P from *p* into a sphere of radius *pq;* and so for each point of the wave-front. Now, the spheres so described about A and *p* as centres obviously touch the plane *bβ*; consequently they touch the other plane *bα*, which makes the angle A*bα* equal to A*bβ*. Now, *bπα* is the front of the reflected wave, and A*α* is the direction in which it is proceeding. Hence, obviously, the ordinary laws of reflection. See CATOPTRICS.

Refraction at a Plane Surface into an Isotropic Medium.—Here we take account of the change of velocity which light suffers in passing from one medium to another. In fig. 3, A, P, B, b, p, q, and β represent the same as before—but suppose Aα now to represent the space through which the wave travels in the second medium, while it would travel from B to b in the first. With centre A and radius Aα, describe a sphere. Let $b\alpha$ touch this sphere in α. Then $b\alpha$ is the front of the refracted wave. For, if $p\pi$ be drawn perpendicular to $b\alpha$, we have

$$p\pi : A\alpha :: bp : bA :: pq : A\beta.$$

Hence, while A travels to α, and B to b, P travels to p, and thence to π. And the sines of the angles BAb and A$b\alpha$, which are the angles of incidence and refraction, are to each other as Bb to Aα—i.e., as the velocity in the first medium is to that in the second. See DIOPTRICS.

It is obvious from the cut, that, the *less* is the velocity in the second medium, the more nearly does the refracted ray enter it at right angles to its surface. As a contrast, we introduce here a sketch of Newton's admirable investigation of the same problem on the corpuscular hypothesis. Let AB (fig. 4) be the common surface of the two media,

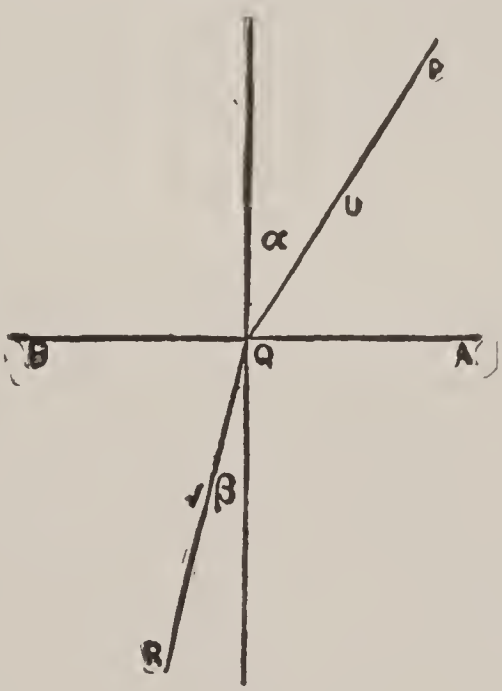


Fig. 4.

PQR the path of a corpuscle. Let U and V be the velocities in the two media, α and β the angles of incidence and refraction. Then, the forces which act on the corpuscle being entirely perpendicular to the refracting surface, the velocity *parallel* to that surface is not altered. This gives

$$U \sin. \alpha = V \sin. \beta.$$

Also the kinetic energy is increased by the loss of potential energy in passing from the one medium to the other. Hence the square of V exceeds that of U by a quantity which depends only on the nature of the two media and of the corpuscle. This shows that V is the same whatever

be the direction of the ray, and then the first relation proves that the sines of the angles of incidence and reflection are *inversely* as the velocities in the two media—i.e., the refracted ray is more nearly perpendicular to the refracting surface the *greater* is the velocity in the second medium. It is very singular that two theories so widely dissimilar should each give the true *law* of refraction; and, in connection with what has just been said, it may be mentioned that on the corpuscular theory a corpuscle passes from one point to another with the least *action*, while on the Undulatory Theory it passes in the least *time*. Hamilton's (q.v.) grand principle of *Varying Action* includes both of these.

Interference.—Fresnel's mode of exhibiting this phenomenon (whose discovery is due to Young) is very simple and striking. An isosceles prism of glass, with an angle very nearly 180°, is placed, as in fig. 5, symmetrically in front of a brilliant point (e.g., the image of the sun formed by a lens of very short focus). The effect of the prism is that light which passes from O through the portion QR appears to have come from some point such as A (the

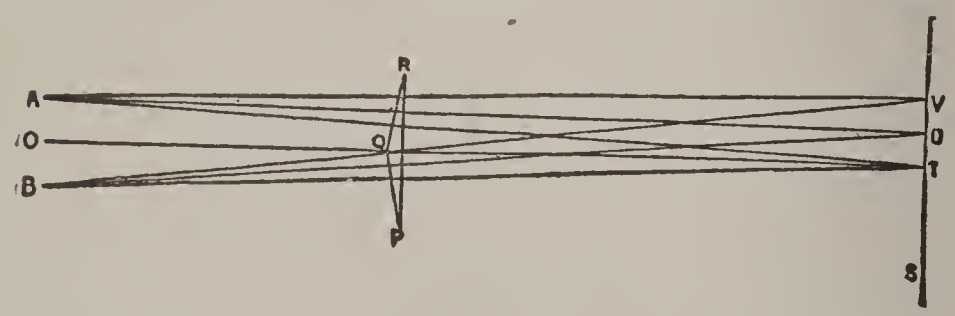


Fig. 5.

image of O as seen through the upper half of the prism). Similarly, the light which has passed through PQ appears to come from some point B. The light which has passed through the prism is to be received on a white screen ST. At the point T, which is in the prolongation of the line OQ, the distances TA and TB are equal; but for no other point, as U, in the line ST, are UA and UB equal. Suppose U and V to be such that UA and UB differ in length by half a wave-length of some particular color, VA and VB by a whole wave-length of the same; then waves arriving at T, as if from A and B, have passed over equal spaces; consequently their crests coincide, so that at T they reinforce each other. But at U a hollow from A is met by a crest from B, so that darkness is the result. At V, again, crest and crest coincide. And so on. Hence, if we are experimenting with one definite color of light, the effect on the screen is to produce at T, V, etc., bright bands of that color, all parallel to the edges of the prism PQR. At points like U there are dark bands. And the length of a wave can easily be calculated from this experiment; for the lengths of OQ and QT can be measured, and, knowing the angles of the prism and its refractive index (see REFRACTION) for the particular color employed, we can calculate the positions of A and B. We have then only to measure the dis-

tance TV between the centres of the two adjoining bright bars, and then geometry enables us to calculate the difference of the lengths of VA and VB, which, as we have seen, is the length of a wave. The results of this experiment show how very minute are these wave-lengths for visible rays. Thus, for

		Inch.
Extreme Red,	the wave-length in air is	0·0000266
" Violet,	" " "	0·0000167

These are, roughly, the $\frac{1}{40000}$ and the $\frac{1}{60000}$ of an inch. Inasmuch, then, as light describes 200,000 m. per second, the number of waves which enter the eye per second are-

Extreme Red, . .	460	millions of millions.
" Violet, . .	730	" "

These numbers, compared with those of sonorous waves (see SOUND), show the extraordinary difference in delicacy between the optic and auditory nerves. But whereas the range of the ear is somewhere about 12 octaves, that of the eye is less than one.

Diffraction.—(See this title.)

Dispersion.—We have just now seen that, by Fresnel's interference experiment, waves of different lengths are separated (for in the last figure the position of the bright line V depends on the length of the waves which produce it). But the different colors also are separated by common refraction, as in Newton's celebrated experiment: see SPECTRUM. This shows, of course, that, in refracting media, waves of different colors move with different velocities; and, as the violet are more refracted than the red, it appears that the shorter waves move more slowly in glass or water than the longer ones. In free space, waves of all lengths travel with equal speed, else (see ABERRATION) all stars ought to appear drawn out into spectra, in consequence of the earth's annual motion. Also, a star suddenly breaking out, or suddenly vanishing (a phenomenon several times observed), should flash out first red, and gradually become white, or should gradually decay from white to violet—which is not observed to be the case. These facts are the most difficult to explain of any to which the Undulatory Theory has yet been applied. Fresnel, indeed, appears to have been in possession of a solution of the difficulty; but the Appendix to one of his papers, to which he more than once refers as containing this explanation, was not found among his MSS. Cauchy and others have, however, by delicate investigations, shown that, *if the forces exerted by the molecules of a refracting body on the ether are exerted through distances comparable with the length of a wave*, the velocity of light will then depend on the wave-length. The velocity is, in fact, shown to be represented by a formula such as this:

$$A - \frac{B}{\lambda^2},$$

where A and B are constant quantities for a given medium, and λ is the length of a wave. The larger λ is, the less

is the second term of the formula, and therefore the velocity is the greater. A very singular result follows from this formula—viz., that the velocity becomes more and more nearly equal to A as the wave-length is greater. Hence waves of low radiant heat, which (see HEAT) are merely waves of light which are incapable of producing vision, must be crowded together toward a limit, not very far beyond the red end of the spectrum.

Polarization.—We now come to a set of phenomena which give further information as to the nature of luminiferous waves. When two beams of light, such as those in Fresnel's experiment, are polarized in planes perpendicular to each other (see POLARIZATION) before they meet, *they do not interfere.* This is in accordance with the assumption required for the explanation of the existence of polarization itself—viz., that the vibrations of the ether take place *transversely* to the direction of the ray.

Double Refraction.—Our assumptions, forced upon us by experimental results, are now so far complete that we may proceed, after Fresnel, to apply them to the explanation of double refraction: see POLARIZATION: REFRACTION, DOUBLE. This explanation is extremely beautiful, and when published was justly hailed as the greatest step in physical science which had been made since Newton deduced the facts of physical astronomy from the law of gravitation.

As we have seen above, in treating of simple reflection and refraction, that the form and velocity in and with which a disturbance spreads from any point of a wave are all that is required for determination of the course of a ray, we must endeavor to find the form in which a disturbance spreads in a double-refracting crystal; and this should lead us to a construction for each of the two rays.

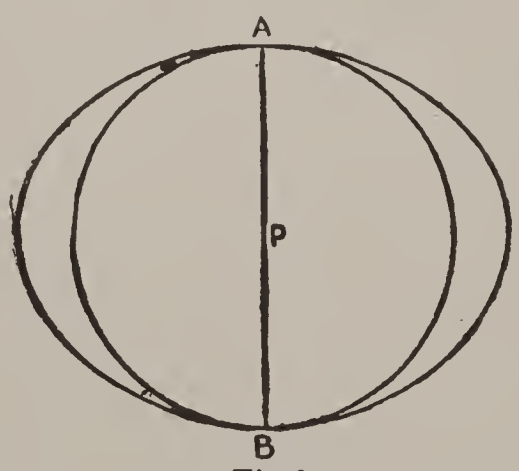


Fig. 6.

Huyghens had already pointed out that one of the two rays produced by Iceland-spar follows the ordinary law of refraction. Hence the disturbances which give rise to this ray are propagated in spherical waves in the crystal. He showed also that the other ray could be accounted for if the disturbances to which it is due were propagated in the form of an oblate spheroid touching the sphere with the extremities of its axis, that axis being parallel to the crystallographic axis of the mineral. The above dia-

gram (fig. 6) will make this clear: P is the point where the ether is disturbed. Two waves spread from P in the form shown in the cut, the line APB being the axis of rotation of the spheroid, and parallel to the axis of the crystal. Thus, let rays αA, etc. (fig. 7), of which AB is the wave-front, fall upon the surface Ab of such a crystal; and let AC be the direction of its axis. Draw, about A as

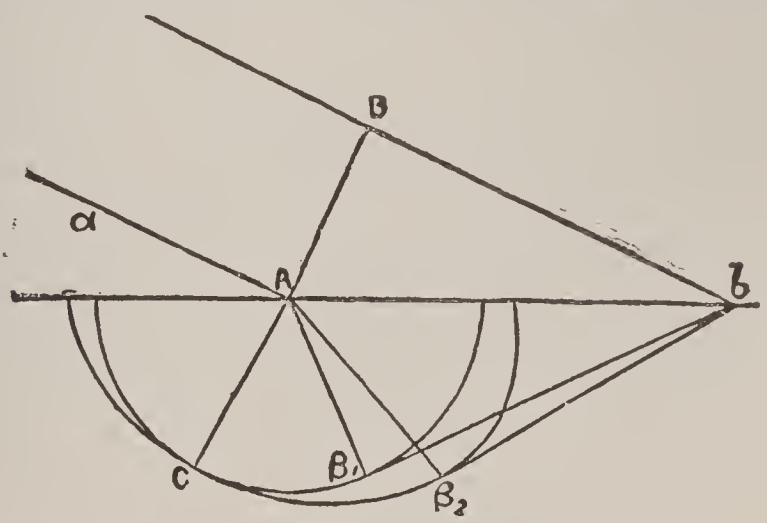


Fig. 7.

centre, the sphere and spheroid into which the disturbance at A spreads in the crystal while light in air passes from B to b. Then if planes be drawn through the line b (perpendicular to the paper) so as to touch the sphere in β_1 and the spheroid in β_2, these planes will touch respectively all the intermediate spheres and spheroids produced by disturbances at points between A and b. [This is evident from simple geometry.] Thus, $b\beta_1$ and $b\beta_2$ are the new wave-fronts; and the ray αA, falling on the crystal, is divided into the two Aβ_1 and Aβ_2. Of these, Aβ_1 is the ordinary ray, and, being produced by spherical waves, has all the properties of a ray ordinarily refracted. It obviously moves perpendicularly to its front, as Aβ_1 is perpendicular to $\beta_1 b$.

But it is otherwise with Aβ_2, which is, in general, *not perpendicular to its front*, $\beta_2 b$. Again, if AC, the axis of the crystal, be not in the plane of incidence, the ray Aβ_2 is not in that plane; so that here we have *refraction out of the plane of incidence.*

The exact accordance of this construction with observation was proved by the careful experiments of Wollaston. We have to add only that the two rays Aβ_1 and Aβ_2 are, in all cases, completely polarized in planes at right angles to each other.

The experiments of Brewster showed that in far the greater number of minerals and artificial crystals *both* rays are extraordinary—i.e., neither of them can be accounted for by disturbances propagated spherically in the crystal. But no tentative process could lead to the form of the wave-surface in this most general case. Here Fresnel's genius supplied the necessary construction.

He assumes that the ether in a crystallized body is possessed of different rigidity, or different inertia, in different

directions—a supposition in itself extremely probable, from the mechanical and other properties of crystals. In the general case there are shown to be three principal directions in a crystal, in any one of which, if the ether be displaced, the resulting elastic force is in the direction of the displacement. Each of these is, in all cases, perpendicular to the others. Any given displacement of the ether corresponds to partial calculable displacements parallel to each of these lines; thus the elastic force consequent on any displacement whatever is known if we know those for the three rectangular directions. All the calculations are thus dependent on *three* numbers only, for each substance.

To find the form in which a disturbance will spread, Fresnel proceeds as follows: Let the plane of the paper represent the front of a wave in the crystal, and suppose a particle of ether to be displaced in it from A to B (fig. 8). This displacement may be resolved (by the law of the parallelogram of velocities, forces, etc.) into two components in any two directions in the plane of the paper. Assume

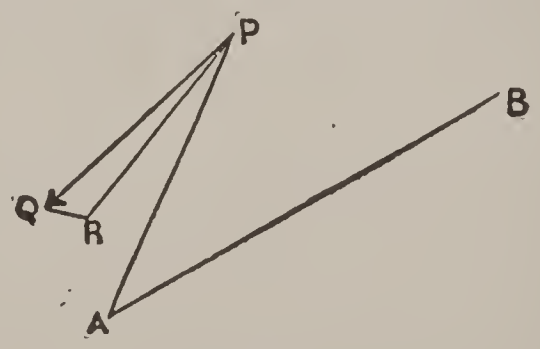


Fig. 8.

AP to be one of these, and let PQ be the force produced by disturbing the particle of ether from A to P. In general, PQ will *not* lie in the plane of the paper. Let fall a perpendicular, QR, upon the plane of the paper. In general, the point R will not lie in AP. The portion RQ of the elastic force of the ether, Fresnel neglects, because it would produce vibrations perpendicular to the wave-front—i.e., *similar to those of sound*—and he assumes that such normal vibrations do not produce visible light. We shall recur to this point. Fresnel now assumes that the vibrations which will be propagated continuously in the crystal are such as have PR coincident in direction with AP; and then the rate of their propagation will depend on the ratio of PR to PA. He shows by mathematical reasoning that there are *two* such directions in every wave-front, and that they are always *perpendicular* to each other. This, of course, at once accounts for double refraction, the complete polarization of each of the two rays, and their being polarized in planes perpendicular to each other. The original plane wave is now broken into two, both parallel to the first, but in general moving at different rates. He next considers a disturbance at any point in a crystal as equivalent to waves having fronts in *every* plane passing through that point, and investigates mathematically the form of the surface which is touched by the planes of all the pairs of polarized rays which have (in any given time)

proceeded from each of those wave-fronts. The form of this surface is very remarkable: it is symmetrical with reference to three planes at right angles to each other. These, of course together, cut it into eight parts, one of which is figured below (fig. 9). From this it appears, though Fresnel did not perceive it, that the surface has four *conical cusps*, as they are called, the inner portion

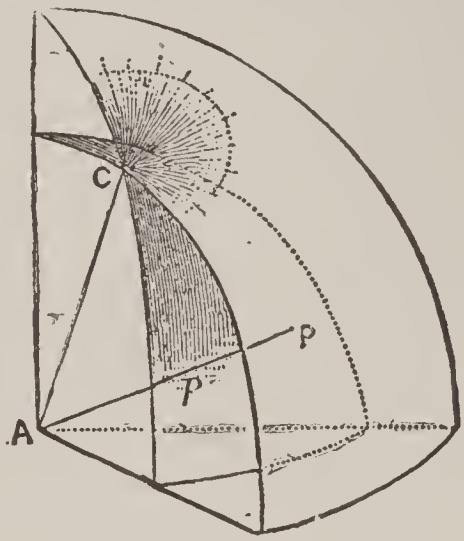


Fig. 9.

seeming to be drawn through a hole, as it were, and then spreading out again to form the outer portion: the external appearance of these points resembles the portion of an apple round the point of attachment of the stalk. Fresnel showed that, in particular cases, when two of the three principal elasticities are equal, this surface degenerates into the sphere and spheroid of Huyghens above described for Iceland-spar; and that, when all three are equal, it becomes a single sphere, as in glass, water, and other singly refracting bodies. All this, of course, is in complete accord with experiment. But there is vastly more. If we use the wave-surface of Fresnel to construct the refracted rays, just as we employed the sphere for simple refraction, or the sphere and spheroid for Iceland-spar, we find generally *two* definite refracted rays (both usually out of the plane of incidence) for one incident ray. But Hamilton (q.v.), the first to perceive the existence of the cusps above described, saw that they indicated the existence of a very remarkable phenomenon, to which he gave the name Conical Refraction (q.v.). The ray which, in the crystal, passes from A to C (the cusp—see last figure), has not, like other rays such as A*p*P, two definite wave-fronts. For if at *p* and P, where the line A*p*P meets the inner and outer portions of the wave-surface, we draw tangent planes, these are the definite fronts of the corresponding waves; so that such a ray will split into two only, on leaving the crystal. But AC intersects the surface at C, where it is *conical*, and has an *infinite* number of tangent planes; so that when it leaves the crystal it will split into an infinite number, forming a hollow cone. Hamilton's prediction then was: If a single ray of light be made to pass through a plate of a biaxal crystal in the direction AC (limiting it, for instance,

by sheets of tinfoil with small holes in them properly fixed on each side), it will enter and emerge as a hollow cone. Also the plane of polarization will differ for different rays in this cone. Lloyd completely verified this wonderful prediction by experiments made with a plate of *Arragonite* (q.v.). But more, Hamilton observed that (see last figure) the wave-surface can be touched by a tangent plane in a circle surrounding the cusp. If, then, we make the construction of fig. 7 with Fresnel's wave instead of the sphere and spheroid, there will be a definite direction of the incident ray αA, for which the tangent planes $b\beta_1$ and $b\beta_2$ in that figure will coincide, and will touch the wave-surface in the circle about the cusp. Any line drawn from A to a point in that circle will be a direction for a refracted ray. Hence the ray αA will be broken up into a hollow cone of rays, the vertex of the cone being A, and its base this circle. If the crystal be cut into a plate, each ray will of course emerge parallel to αA, and the *ensemble* of them will form a hollow cylinder. The prediction then is that a single definite ray, falling in a given direction on such a plate of crystal, will emerge as a hollow cylinder. This, and the predicted laws of the polarization of the light of the cylinder, also were verified by Lloyd.

'The formulæ which led to such triumphantly successful predictions *may* have been deduced from incomplete or even erroneous premises; but they *represent a truth*, and must in time conduct us step by step back to ultimate proof of the truth of Fresnel's assumptions, and of the Undulatory Theory of Light, as now understood, or show us what modifications may be required in the original conceptions.'

It would unduly lengthen this article, and besides would lead us into discussions far too recondite for a work like this, to enter upon the question of whether the vibrations in polarized light are *perpendicular to* or *in* the plane of polarization—a subject recently well investigated by Stokes (q.v.); or to consider the production of elliptically polarized light by reflection at the surface of metals, diamond, etc.; and various other important points of the theory. We only mention that Green, Cauchy, Stokes, and others, who have entered deeply into the mechanical question of luminiferous vibrations, have found themselves obliged to take into account the *Normal* wave, which, as we have seen, Fresnel neglected.

Fluorescence (see PHOSPHORESCENCE), Spectrum Analysis (see SPECTRUM), and various other important recent additions to the theory can be merely mentioned; as also the very remarkable observation of Maxwell which appears to connect Light and Electricity, and was derived from a theory which assumes the ether to be the vehicle of Electricity and Magnetism as well as of Light and Heat, and by which it appears that the velocity of Light is expressible in terms of the static and kinetic units of Electricity (q.v.).

For some recent metaphysical and experimental suggestions opposed to the Undulatory Theory, see SUBSTANTIALISM.

For further information, the general reader may consult Lloyd's *Wave-theory,* an excellent elementary treatise: while the mathematician may consult Airy's *Tract on the Undulatory Theory;* and Herschel's article 'Light' in *Encyclopædia Metropolitana.*

UNDULY: see under UNDUE.

UNDUTIFUL, a. *ŭn-dū'tĭ-fŭl:* not obedient; wanting in respect and duty. UNDU'TIFULLY, ad. UNDU'TIFULNESS, n. want of respect; disobedience. UNDU'TEOUS, a. *-t'yus,* in *OE.*, not performing one's duty; disobedient.

UNDY, a. *ŭn'dĭ* [from L. *unda,* a wave]: in *her.*, wavy: see HERALDRY.

UNDYING, a. *ŭn-dī'ĭng:* not subject to death; not perishing; enduring; immortal.

UNEARNED, a. *ŭn-ėrnd':* not earned or obtained by labor or merit.

UNEARNED'-IN'CREMENT: in *polit. econ.*, the increase in the value of land produced without labor or expenditure on the part of the owner—e.g., by the growth of a town in its vicinity. John Stuart Mill and his followers contend that this increment should belong to the nation.

UNEARTH, v. *ŭn-ėrth':* to drive from the earth or from a burrow; to uncover; to expose. UNEARTHED', a. *-ėrtht',* driven from the earth or from a den or burrow; freed from the cover of earth, as roots; discovered or exposed to view. UNEARTH'LY, a. not of earth; supernatural.

UNEASY, a. *ŭn-ē'zĭ:* restless; disturbed; constrained; disagreeable; feeling some degree of pain or discomfort. UNEA'SILY, ad. with a certain degree of pain. UNEA'SINESS, n. restlessness; disquietude.—SYN. of 'uneasy': painful; disturbed; constraining; cramping; constrained; awkward; stiff; peevish; difficult.

UNEATH, ad. *ŭn-ēth'* [see EATH]: in *OE.*, not easily; scarcely: ADJ. in *OE.*, uneasy; difficult.

UNEBBING, pp. *ŭn-ĕb'bĭng:* not receding, as the ebb of the tide.

UNEDIFYING, a. *ŭn-ĕd'ĭ-fī-ĭng:* not edifying or improving to the mind. UNED'IFIED, a. not improved or instructed in mind or disposition.

UNEDUCATED, a. *ŭn-ĕd'ū-kā-tĕd:* illiterate; ignorant.

UNEFFACED, a. *ŭn'ĕf-fāst':* not effaced, as from the mind; not obliterated or destroyed, as a writing or a figure on the surface of a thing.

UNEFFECTUAL, a. *ŭn'ĕf-fĕk'tū-ăl:* ineffectual.

UNELECTED, a. *ŭn'ĕ-lĕk'tĕd:* not chosen; not preferred.

UNEMBARRASSED, a. *ŭn'ĕm-băr'răst:* not perplexed or confused in mind or deportment; free from pecuniary difficulties or incumbrances.

UNEMBITTERED, a. *ŭn'ĕm-bĭt'tėrd:* not rendered distressing; not exasperated.

UNEMBODIED, a. *ŭn'ĕm-bŏd'ĭd:* free from a corporeal body; not collected or formed into a body, as troops.

UNEMOTIONAL, a. *ŭn'ē-mō'shŭn-ăl:* not subject to emotion.

UNEMPHATIC, a. *ŭn'ĕm-făt'ĭk:* not characterized by emphasis or expressiveness. UN'EMPHAT'ICALLY, ad. without energy or emphasis.

UNEMPLOYED, a. *ŭn'ĕm-ploȳd':* not occupied; without employment; at leisure; not engaged in work; not in use.

UNEMPOWERED, a. *ŭn'ĕm-pow'rd:* not empowered or authorized.

UNENCUMBERED, a. *ŭn'ĕn-kŭm'bĕrd:* not encumbered or burdened, as an estate by mortgages, annuitants, debts, etc.

UNENDING, a. *ŭn-ĕnd'ĭng:* not coming to an end; not terminating; everlasting.

UNENDOWED, a. *ŭn'ĕn-dowd':* not endowed, as with talent; not supplied with a permanent fund.

UNENDURABLE, a. *ŭn'ĕn-dū'rā-bl:* not to be endured; intolerable.

UNENGAGED, a. *ŭn'ĕn-gājd':* not bound by promise, as to marry; free from obligation; not occupied. UN'ENGA'GING, a. not adapted to win the affections; not inviting.

UNENGLISH, a. *ŭn-ĭng'glĭsh:* not according to English character in speech or action.

UNENJOYED, a. *ŭn'ĕn-joyd':* not obtained or enjoyed; not possessed with satisfaction.

UNENLARGED, a. *ŭn'ĕn-lärjd':* not increased in bulk or extent.

UNENLIGHTENED, a. *ŭn'ĕn-līt'nd:* not enlightened.

UNENLIVENED, a. *ŭn'ĕn-lĭv'nd:* not enlivened or animated.

UNENSLAVED, a. *ŭn'ĕn-slāvd':* not in bondage; free.

UNENTANGLED, a. *ŭn'ĕn-tăng'gld:* not entangled; not confused or disordered; not involved; not complicated.

UNENTERTAINING, a. *ŭn-ĕn'tĕr-tān'ĭng:* not entertaining or amusing.

UNENTHRALLED, a. *ŭn'ĕn-thrawld':* not enslaved or reduced to thraldom.

UNENVIABLE, a. *ŭn-ĕn'vĭ-ă-bl:* not capable of exciting envy; not desirable; wretched or embarrassing, as an *unenviable* position. UNEN'VIED, a. exempt from the envy of others. UNEN'VIOUS, a. free from envy.

UNEQUABLE, a. *ŭn-ĕk'wă-bl:* different at different times; not uniform.

UNEQUAL, a. *ŭn-ē'kwŏl:* not even; not of the same size, age, etc.; inferior; inadequate; insufficient; ill-proportioned; ill-matched; not regular or uniform; in *OE.*, unjust. UNE'QUALLED, a. unparalleled; unrivalled. UNE'QUALLY, ad. in different degrees; in *OE.*, unjustly.

UNEQUIVOCAL, a. *ŭn'ĕ-kwĭv'ō-kăl:* not doubtful; clear; evident; not of doubtful signification. UN'EQUIV'OCALLY, ad. UN'EQUIV'OCALNESS, n. the state of being unequivocal.

UNERRING, a. *ŭn-ĕr'rĭng:* committing no mistake; incapable of error; certain; sure. UNER'RINGLY, ad. in an unerring manner; without mistake.

UNESPIED, pp. *ŭn'ĕs-pīd':* not seen; undiscovered; undescried.

UNESSAYED, a. *ŭn'ĕs-sād':* unattempted.

UNESSENTIAL, a. *ŭn'ĕs-sĕn'shăl:* not absolutely necessary; not necessary to the existence of a thing; unimportant.

UNEVANGELICAL, a. *ŭn'ē-văn-jĕl'ĭ-kăl:* not according to the gospel as interpreted by different sects, or by a party in a church.

UNEVAPORATED, a. *ŭn'ĕ-văp'ō-rā-tĕd:* that has not passed off in vapor; not dissipated.

UNEVEN, a. *ŭn-ē'vn:* not even or level; not uniform, as temper; not of equal length; in *OE*, incongruous; unsuitable; troublesome. UNE'VENLY, ad. UNE'VENNESS, n. the state of not being level; want of uniformity or level ness.

UNEXAGGERATED, a. *ŭn'ĕgz-ăj'ĕr-ā-tĕd:* not enlarged beyond the truth.

UNEXALTED, a. *ŭn'ĕgz-awl'tĕd:* not raised high; not elevated in power.

UNEXAMINED, a. *ŭn'ĕgz-ăm'ĭnd:* not inquired into or investigated; not interrogated.

UNEXAMPLED, a. *ŭn'ĕgz-ăm'pld:* having no example or similar case; unprecedented.

UNEXCELLED, a. *ŭn'ĕk-sĕld':* not excelled or surpassed.

UNEXCEPTIONABLE, a. *ŭn'ĕk-sĕp'shŭn-ă-bl:* not liable to any exception; unobjectionable.

UNEXCITED, a. *ŭn'ĕk-sī'tĕd:* not roused or stirred up.

UNEXCLUDED, a. *ŭn'ĕks-klō'dĕd:* not hindered; not debarred.

UNEXECUTED, a. *ŭn-ĕks'ĕ-kū-tĕd:* not performed; not signed or sealed, as a deed.

UNEXEMPLIFIED, a. *ŭn'ĕgz-ĕm'plĭ-fīd:* not illustrated by example.

UNEXERCISED, a. *ŭn-ĕks'ĕr-sīzd:* not exercised; not practiced; not disciplined.

UNEXERTED, a. *ŭn'ĕgz-ĕr'tĕd:* not called into action; not enforced.

UNEXHAUSTED, a. *ŭn'ĕgz-awst'ĕd:* not all used or spent.

UNEXPECTED, a. *ŭn'ĕks-pĕk'tĕd:* not looked for; sudden; taken by surprise. UN'EXPEC'TEDLY, ad. at a time or in a manner not looked for; suddenly. UN'EXPEC'TEDNESS, n. the quality of being unexpected. UN'EXPEC'TANT, a. not expectant.

UNEXPIRED, a. *ŭn'ĕks-pīrd':* not ended; that has not come to an end through lapse of time; still in existence or force.

UNEXPLAINABLE, a. *ŭn'ĕks-plān'ă-bl:* not capable of being made plain to the understanding; inexplicable. UN'EXPLAINED', a. not made plain or intelligible.

UNEXPLORED, a. *ŭn'ĕks-plōrd':* not searched out or examined; unknown.

UNEXPLOSIVE, a. *ŭn'ĕks-plō'sĭv:* not explosive.

UNEXPORTED, a. *ŭn'ĕks-pōrt'ĕd:* not sent out of a country.

UNEXPOSED, a. *ŭn'ĕks-pōzd':* not laid open to view; concealed.

UNEXPOUNDED, a. *ŭn'ĕks-pownd'ĕd:* not explained or interpreted.

UNEXPRESSED, a. *ŭn'ĕks-prĕst':* not expressed or put in words; not mentioned or named. UN'EXPRES'SIVE, a. not representing with force; not emphatic; in *OE.*, unutterable; ineffable.

UNEXPUNGED, a. *ŭn'ĕks-pŭnjd':* not expunged or blotted out; not obliterated.

UNEXTENDED, a. *ŭn'ĕks-tĕnd'ĕd:* having no dimensions; occupying no assignable space.

UNEXTINGUISHABLE, a. *ŭn'ĕks-tĭng'gwĭsh-ă-bl:* that cannot be extinguished; that cannot be quenched. UN'EXTIN'GUISHED, a. not quenched; not entirely repressed.

UNEXTORTED, a. *ŭn'ĕks-tŏrt'ĕd:* spontaneous; not drawn out by force or compulsion.

UNFABLED, a. *ŭn-fā'bld:* not fictitious; real; true.

UNFADED, a. *ŭn-fā'dĕd:* not having lost its strength or color; not withered. UNFA'DING, a. not liable to lose its freshness; not transient; not liable to wither. UNFA'DINGNESS, n. the quality of being unfading.

UNFAILING, a. *ŭn-fāl'ĭng:* not liable to fail; not capable of being exhausted; certain. UNFAIL'INGLY, ad.

UNFAIR, a. *ŭn-fär':* not impartial; using trick or artifice; trickish; dishonest; not just. UNFAIR'LY, ad. not in a just manner. UNFAIR'NESS, n. dishonesty of conduct or practice; the state or quality of being not honorable or candid in one's dealings; injustice.

UNFAITHFUL, a. *ŭn-fāth'fŭl:* inconstant; not observant of promises; violating trust or confidence; negligent of duty; in *OE.*, impious; infidel. UNFAITH'FULLY, ad. UNFAITH'FULNESS, n. neglect or violation of vows or promises; breach of confidence or trust reposed; in *OE.*, impiety.

UNFALTERING, a. *ŭn-fawl'tĕr-ĭng:* not failing; not hesitating.

UNFAMILIAR, a. *ŭn'fă-mĭl'yĕr:* not rendered agreeable by frequent use; not accustomed; not known or acquainted with. UN'FAMIL'IAR'ITY, n. the state of being unfamiliar.

UNFASHIONABLE, a. *ŭn-făsh'ŭn-ă-bl:* not according to the prevailing mode; not regulating dress, etc., according to the reigning custom. UNFASH'IONABLENESS, n. neglect of the prevailing mode. UNFASH'IONABLY, ad.

UNFASHIONED, a. *ŭn-făsh'ŭnd:* not fashioned or modified by art; not having a regular form.

UNFASTEN, v. *ŭn-făs'n:* to loose; to unbind; to untie; undo the fastenings of. UNFAST'ENED, pp. loosed; untied.

UNFATHERED, a. *ŭn-fâth'ĕrd:* having no father. UNFATH'ERLY, a. unkind; not becoming a father.

UNFATHOMABLE, a. *ŭn-făth'ŭm-ă-bl:* that cannot be fathomed or sounded by line; too deep for measuring. UNFATH'OMABLY, ad. UNFATH'OMED, a. that has not been fathomed; exceedingly deep.

UNFAVORABLE, a. *ŭn-fā'vĕr-ă-bl:* not disposed to countenance; not kind or obliging; not propitious; discouraging; in *OE.*, ill-looking. UNFA'VORABLY, ad. UNFA'VORABLENESS, n. the quality of being unfavorable; want of disposition to countenance or support. UNFA'VORED, a. not favored or assisted.

UNFEARED, a. *ŭn-fērd':* not feared or dreaded.

UNFEASIBLE, a. *ŭn fē'zĭ-bl:* impracticable.

UNFEATHERED, a. *ŭn-fĕth'ĕrd:* having no feathers; unfledged.

UNFEED, a. *ŭn-fēd'* [*un*, and *fee*]: not having received a fee; unpaid.

UNFEELING, a. *ŭn-fēl'ĭng:* void of sensibility; cruel; callous. UNFEEL'INGLY, ad. UNFEEL'INGNESS, n.

UNFEIGNED, a. *ŭn-fānd'* or *ŭn-fān'ĕd:* not counterfeit; real; sincere. UNFEIGN'EDLY, ad. without hypocrisy; sincerely.

UNFELT, a. *ŭn-fĕlt':* not felt; not perceived.

UNFEMININE, a. *ŭn-fĕm'ĭ-nĭn:* not according to the female character or manners.

UNFENCED, a. *ŭn-fĕnst':* uninclosed by a fence.

UNFERMENTED, a. *ŭn'fĕr-mĕnt'ĕd:* that has not undergone the process of fermentation; unleavened.—UNFERMENTED BREAD, bread made without yeast or other fermentative. The dietetic advantages of the form of unfermented bread known as aërated bread are considered to be its perfect cleanness and purity, its light and uniform texture, and its sweet and agreeable flavor; also the fact that it retains much of the ingredients of the wheat which enter into the formation of blood and muscle, and are allowed to escape in fermented bread. It is recommended for ordinary diet, particularly in cases of indigestion, flatulence, etc.—See AËRATED BREAD.

UNFETTER, v. *ŭn-fĕt'tĕr:* to loose from fetters or bonds; to free from restraint. UNFET'TERED, pp.: ADJ. free from restraint.

UNFIGURED, a. *ŭn-fĭg'ūrd:* plain; not covered or adorned with figures.

UNFILIAL, a. *ŭn-fĭl'ĭ-ăl:* undutiful; not becoming a child.

UNFILLED, a. *ŭn-fĭld':* not filled; not fully supplied.

UNFINISHED, a. *ŭn-fĭn'ĭsht:* not complete; not brought to an end; wanting the last touch.

UNFIT, a. *ŭn-fĭt':* unsuitable; unqualified; unworthy; incompetent: V. to disable; to disqualify. UNFIT'TING, imp.: ADJ. disqualifying; unbecoming; improper. UNFIT'TED, pp. disqualified; rendered unsuitable. UNFIT'LY, ad. UNFIT'NESS, n. want of suitable powers or qualifications; want of propriety or adaptation to character or place.

UNFIX, v. *ŭn-fĭks':* to remove, as a bond or fastening; to loose from that which fastens; to unsettle. UNFIX'ING, imp. UNFIXED', pp.: ADJ. wandering; inconstant; having no settled object. UNFIX'EDNESS, n. the state of being unfixed or unsettled.

UNFLAGGING, a. *ŭn-flăg'gĭng:* not drooping; maintaining strength or spirit.

UNFLATTERING, a. *ŭn-flăt'tĕr-ĭng:* not concealing the truth; not gratifying with obsequious behavior.

UNFLEDGED, a. *ŭn-flĕjd':* not yet furnished with feathers; not having attained to full growth.

UNFLESHED, a. *ŭn-flĕsht':* not seasoned to blood; untried.

UNFLINCHING, a. *ŭn-flĭnsh'ĭng:* not shrinking; resolute.

UNFOILED, a. *ŭn-foyld':* not vanquished.

UNFOLD, v. *ŭn-fōld':* to expand; to open; to spread out; to lay open to view; to disclose; to reveal. UNFOLD'ING, imp.: N. the act of expanding or disclosing. UNFOLD'ED, pp.

UNFOLD, v. *ŭn-fōld':* to set free from a fold, as sheep.

UNFORBIDDEN, a. *ŭn'fŏr-bĭd'n:* not prohibited; allowed.

UNFORCED, a. *ŭn-fōrst':* not constrained; not urged or impelled; not feigned; natural; not violent.

UNFORESEEN, a. *ŭn'fōr-sēn':* not seen or known beforehand.

UNFORETOLD, a. *ŭn'fōr-tōld':* not predicted.

UNFOREWARNED, a. *ŭn'fōr-wawrnd':* not previously warned or admonished.

UNFORGETFUL, a. *ŭn'fŏr-gĕt'fŭl:* not forgetful.

UNFORGIVEN, a. *ŭn'fŏr-gĭv'n:* not pardoned. UN'FORGIV'ING, a. not disposed to overlook or pardon offenses; implacable.

UNFORGOTTEN, a. *ŭn'fŏr-gŏt'n,* or UN'FORGOT', a. *-gŏt':* not lost to memory; not overlooked.

UNFORMED, a. *ŭn-fawrmd':* not modified or molded into regular shape.

UNFORSAKEN, a. *ŭn'fŏr-sā'kn:* not deserted; not entirely neglected.

UNFORTIFIED, a. *ŭn-fŏr'tĭ-fīd:* not secured from attack by walls and defenses; not guarded; defenseless.

UNFORTUNATE, a. *ŭn-fŏr'tū-nāt:* not successful; not prosperous. UNFOR'TUNATELY, ad. without success; unhappily; unluckily.

UNFOSSILIZED, a. *ŭn-fŏs'sĭl-īzd:* not converted into stone.

UNFOUGHT, a. *ŭn-fawt':* not contended or contested, as a battle.

UNFOUND, a. *ŭn-fownd':* not found; not met with.

UNFOUNDED, a. *ŭn-fownd'ĕd:* not founded; having no foundation; vain; idle.

UNFRAGRANT, a. *ŭn-frā'grănt:* not sweet-smelling.

UNFRAMED, a. *ŭn-frāmd':* not formed.

UNFRANCHISED, a. *ŭn-frăn'chīzd:* having no franchise; disfranchised.

UNFRAUGHT, a. *ŭn-frawt':* not freighted; not filled or stored.

UNFREED, a. *ŭn-frēd':* not liberated.

UNFREIGHTED, a. *ŭn-frāt'ĕd:* not loaded, as a ship.

UNFREQUENT, a. *ŭn-frē'kwĕnt:* not common; infrequent. UN'FREQUENT'ED, a. rarely visited; seldom resorted to; solitary.

UNFRIENDED, a. *ŭn-frĕnd'ĕd:* wanting friends. UNFRIEND'LY, a. not kind; not favorable. UNFRIEND'LINESS, n. want of kindness.

UNFROCK, v. *ŭn-frŏk':* to disrobe; to divest of a frock; to degrade, as a clergyman from his office.

UNFROZEN, a. *ŭn-frō'zn:* not frozen.

UNFRUGAL, a. *ŭn frō'găl:* not saving or economical.

UNFRUITFUL, a. *ŭn-frōt'fûl:* not producing fruit; unproductive; barren; vain. UNFRUIT'FULLY, ad. UNFRUIT'FULNESS, n. barrenness; unproductiveness.

UNFULFILLED, a. *ŭn'fûl-fĭld':* not accomplished.

UNFUMED, a. *ŭn-fūmd':* not fumigated; in *OE.,* not exhaling smoke, as in fumigation.

UNFUNDED, a. *ŭn-fŭnd'ĕd:* having no permanent fund for the payment of interest; floating. UNFUNDED DEBT, floating debt, consisting of bills, notes, and other obligations of varying amounts, and due at different times (see FUND).

UNFURL, v. *ŭn-fĕrl':* to loose and unfold; to expand. UNFUR'LING, imp. unfolding. UNFURLED', pp. unfolded; expanded.

UNFURNISHED, a. *ŭn-fĕr'nĭsht:* not supplied with furniture; empty; unsupplied.

UNGAINLY, a. *ŭn-gān'lĭ* [L. *un*, not; Scot. *gane*, to suffice, to be fit; *ganand*, fit or becoming: Icel. *gegn*, convenient, suitable: comp. Gael. *geanail*, comely, cheerful]: not expert or dexterous; clumsy; awkward; uncouth. UNGAIN'LINESS, n. clumsiness.

UNGALLANT, a. *ŭn-găl'lănt:* discourteous; rude. UNGAL'LANTLY, ad.

UNGALLED, a. *ŭn-gawld':* unhurt; unwounded.

UNGARNISHED, a. *ŭn-gâr'nĭsht:* not garnished or furnished; unadorned.

UNGARRISONED, a. *ŭn-găr'rĭ-sŭnd:* not furnished with troops for defense.

UNGARTERED, a. *ŭn-gâr'tĕrd:* without garters.

UNGATHERED, a. *ŭn-găth'ĕrd:* not collected; not picked or plucked.

UNGENERATED, a. *ŭn-jĕn'ĕr-ā-tĕd:* unbegotten; having no beginning. UNGEN'ERATIVE, a. *-ĕr-ā-tĭv*, in *OE.*, begetting nothing.

UNGENEROUS, a. *ŭn-jĕn'ĕr-ŭs:* lacking in or destitute of generosity or liberality; illiberal; not magnanimous. UNGEN'EROUSLY, ad. unkindly; dishonorably.

UNGENIAL, a. *ŭn-jē'nĭ-ăl:* not favorable to natural growth.

UNGENTEEL, a. *ŭn'jĕn-tēl':* not consistent with polite manners or good breeding. UN'GENTEEL'LY, ad.

UNGENTLE, a. *ŭn-jĕn'tl:* harsh; rude. UNGENT'LY, ad. harshly. UNGEN'TLENESS, n. harshness; rudeness; unkindness; incivility.

UNGENTLEMANLY, a. *ŭn-jĕn'tl-măn-lĭ*, or UNGEN'TLEMANLIKE, a. *-măn-līk:* not befitting a gentleman. UNGEN'TLEMANLINESS, n. the quality of being unlike a gentleman.

UNGEOMETRICAL, a. *ŭn'jē-ō-mĕt'rĭ-kăl:* not agreeable to the rules of geometry.

UNGIFTED, a. *ŭn-gĭft'ĕd:* not endowed with peculiar faculties.

UNGILDED, a. *ŭn-gĭld'ĕd*, or UNGILT', a. *-gĭlt':* not overlaid with gilding.

UNGIRD, v. *ŭn-gĕrd':* to loose from a girdle or band; to unbind. UNGIRD'ING, imp. UNGIRD'ED, pp., or UNGIRT', pp.: ADJ. loosely dressed.

UNGLADDENED, a. *ŭn-glăd'nd:* not made glad or cheered.

UNGLAZED, a. *ŭn-glāzd':* not furnished with glass, as *unglazed* windows; not coated with a glaze or glazing, as *unglazed* pottery.

UNGLORIFIED, a. *ŭn-glō'rĭ-fīd:* not exalted with praise and adoration.

UNGLOVE, v. *ŭn-glŭv':* to remove the glove from; to uncover the hand by removing the glove.

UNGODLY, a. *ŭn-gŏd'lĭ:* wicked; impious; neglecting the worship of God. UNGOD'LINESS, n. disregard of God and His commands.

UNGORED, a. *ŭn-gōrd':* not gored; unwounded; unhurt by horn or spear.

UNGORGED, a. *ŭn-gŏrjd':* not filled; not sated.

UNGOT, a. *ŭn gŏt'*, or UNGOTTEN, pp. *ŭn-gŏt'n:* not acquired; in *OE.*, not begotten.

UNGOVERNABLE, a. *ŭn-gŭv'ĕrn-ă-bl:* that cannot be governed or restrained; unruly. UNGOV'ERNABLY, ad. UNGOV'ERNABLENESS, n. the quality of not being able to be restrained; unruliness. UNGOV'ERNED, a. not subjected to laws or principles; not restrained or regulated.

UNGRACED, a. *ŭn-grāst':* not embellished or dignified; not honored. UNGRACE'FUL, a. not marked with ease and dignity; wanting beauty and elegance, as manner. UNGRACE'FULLY, ad. awkwardly; inelegantly. UNGRACE'FULNESS, n. want of ease or dignity; awkwardness.

UNGRACIOUS, a. *ŭn-grā'shŭs:* offensive; unpleasing; odious; hateful. UNGRA'CIOUSLY, ad.

UNGRAMMATICAL, a. *ŭn'grăm-măt'ĭ-kăl:* not in accordance with the rules of grammar. UN'GRAMMAT'ICALLY, ad.

UNGRANTED, a. *ŭn-grănt'ĕd:* not conceded; not bestowed or conferred.

UNGRATEFUL, a. *ŭn-grāt'fŭl:* not thankful or showing gratitude, as for favors conferred or kindness shown; not agreeable; unpleasing, as sounds or speech. UNGRATE'FULLY, ad. UNGRATE'FULNESS, n. the state of being ungrateful for favors received; ill return for a kindness; unpleasantness.

UNGRATIFIED, a. *ŭn-grăt'ĭ-fīd:* not pleased or satisfied; not indulged.

UNGRAVELY, ad. *ŭn-grāv'lĭ:* without seriousness.

UNGROUNDED, a. *ŭn-grownd'ĕd:* having no foundation or support; unfounded; false.

UNGRUDGED, a. *ŭn-grŭjd':* given willingly. UNGRUDG'ING, a. freely giving. UNGRUDG'INGLY, ad.

UNGUAL, a. *ŭng'gwăl* [L. *unguis*, a nail, a claw]: pertaining to, of the nature of, or shaped like a nail, claw, or hoof; having a nail, claw, or hoof attached. UN'GUICAL, a. *-gwĭ-kăl*, pertaining to or like a claw. UNGUIC'ULAR, a. *-gwĭk'ū-lĕr*, formed as a nail or claw. UNGUIC'ULATE, a. *-lāt*, or UNGUIC'ULATED, a. *-lā-tĕd*, having claws; in *bot.*, applied to petals which have an unguis or stalk. UNGUIFORM, a. *ŭng'gwĭ-fawrm* [L. *forma*, shape]: claw-shaped. UN'GUIS, n. *-gwĭs*, UN'GUES, n. plu. *-gwēz* [L.]: a claw; in *bot.*, the narrowed part of the base of a petal.

UNGUARDED, a. *ŭn-gärd'ĕd:* not watched; not defended; not attentive to danger; not cautious; inconsiderate. UNGUARD'EDLY, ad. UNGUARD'EDNESS, n. the state of being unguarded.

UNGUENT, n. *ŭng'gwĕnt* [L. *unguentum*, an ointment, a perfume—from *ungo*, I besmear: F. *onguent:* It. *unguento:* comp. Gael. *ung*, to anoint]: a soft composition used externally for the cure of sores, burns, and the like; an ointment. UN'GUENTARY, a. *-gwĕn-tĕr-ĭ*, or UNGUENT'OUS, a. *-gwĕnt'ŭs*, partaking of the qualities of an unguent. —*Unguents* or ointments consist of some active agent in solution, or in the form of a soft extract, or in fine powder, carefully rubbed up with some fatty matter or mixture of several such matters, e.g., prepared lard, prepared suet, white wax, yellow wax, olive-oil, and almond-oil. There are many ointments enumerated in the *Pharmacopœia.* Some, e.g., ointments of aconitia, atropia, and belladonna, are employed to allay neuralgia and local pains; simple ointments (consisting of white wax, prepared lard, and almond-oil) are employed in dressing raw and blistered surfaces; ointments of cantharides and of savin are used to keep up the discharge from issues or blistered surfaces; ointments of creosote, galls, carbonate of lead, oxide of zinc, etc., serve as astringents; ointments of ammoniated mercury, calomel, nitrate and red iodide of mercury, iodine, iodide of potassium, elemi, resin, and turpentine, act as astringents of varying power; and ointment of red oxide of mercury as a mild caustic. Many of the ointments are of special service in skin-diseases, and sulphur ointment is the specific application for itch.

UNGUESSED, a. *ŭn-gĕst':* not reached by conjecture; unsuspected.

UNGUICAL, UNGUICULAR, UNGUICULATE, UNGUIS, etc.: see under UNGUAL.

UNGUICULATA, *ŭn-gwĭk-ū-lā'ta*, in Zoology: a section of the class Mammalia, consisting of animals which have toes furnished with nails or claws. In the system of Linnæus, it includes the orders *Bruta*, *Glires*, *Primates*, and *Feræ;* in that of Cuvier, the orders *Bimana*, *Quadrumana*, *Carnaria*, *Marsupialia*, *Rodentia*, and *Edentata.* See UNGUAL.

UNGUIDED, a. *ŭn-gī'dĕd:* not guided or directed; not regulated.

UNGUILTY, a. *ŭn-gĭl'tĭ:* not guilty; innocent.

UNGULA, a. *ŭng'gū-lă* [L. *ungŭla*, a hoof—from *unguis*, a claw]. a hoof; a hoof-shaped section of a cylinder, cone, or the like, cut off by a plane oblique to the base. UN'GULATE, a. *-lāt*, or UN'GULATED, a. *-lā-tĕd*, hoof-shaped; having the digits inclosed in hoofs. UNGULATA, n. plu. *ŭng'gū-lā'tă*, or UN'GULATES, *-lāts*, the order of mammals which includes the hoofed quadrupeds, classed as *Perissodactyla* and *Artiodactyla* (see these titles: also FOOT: PACHYDERMATA: ZOOLOGY). UN'GULOUS, a. *-lŭs*, pertaining to or resembling a hoof. UN'GULITE-GRIT, *-līt-grĭt* [L. *ungŭla*, a hoof; Eng. *grit*]: in *geol.*, a series of greenish-colored shales and grits occurring near St. Petersburg, so called because their prevailing shell is the *obolus* or *ungula*, a nail-shaped brachiopod.

UNGULED, *ŭng'gūld,* in Heraldry: having hoofs of a tincture different from that of the rest of the bearing.

UNGVAR, or UNGHVAR, *ông'vâr* or *ông-vâr':* important market-town in n.e. Hungary, charmingly situated on the river Ungh, 90 m. n.n.e. of Debreczin. It is the seat of a bp., and has a very old castle, a beautiful church, a seminary and gymnasium. Trade is carried on in salt, cattle, and particularly wine, vines being extensively cultivated in the vicinity. Pop. (1880) 11,373.—U. is also the name of a county or district; about 1,200 sq. m. (pop. 130,000).—Pop. of town (1836) 13,460.

UNHABITABLE, a. *ŭn-hăb'ĭ-tă-bl:* in *OE.,* that cannot be dwelt in; not fit for abode; uninhabitable.

UNHABITUATED, a. *ŭn'hă-bĭt'ū-ā-tĕd:* not accustomed.

UNHACKED, a. *ŭn-hăkt':* not notched or hacked; not hewn.

UNHACKNEYED, a. *ŭn-hăk'nĭd:* not hackneyed; not worn by use and repetition.

UNHALLOWED, a. *ŭn-hăl'lōd:* profane; unholy; impure.

UNHAND, v. *ŭn-hănd':* to loose from the hand; to let go.

UNHANDLED, a. *ŭn-hăn'dld:* not touched; not treated or discoursed on.

UNHANDSOME, a. *ŭn-hănd'sŭm:* awkward; unmanageable; inconvenient; not beautiful; ungraceful; hence, unbecoming; uncivil; illiberal; unfair. UNHAND'SOMELY, ad. ungracefully; inelegantly; illiberally. UNHAND'SOMENESS, n. want of beauty and elegance; unfairness; incivility; illiberalness.

UNHANDY, a. *ŭn hăn'dĭ:* not skilful and ready in the use of the hands; awkward; not convenient. UNHAN'DILY, ad. awkwardly; clumsily. UNHAN'DINESS, n. want of dexterity; awkwardness.

UNHANG, a. *ŭn-hăng':* to divest of hangings, as a room; to take from the hinges, as a door. UNHANGED', or UNHUNG', a. not put to death by hanging.

UNHAPPY, a. *ŭn-hăp'pĭ:* not happy; more or less miserable or wretched; unfortunate; bringing ill fortune; wretched; evil; calamitous; in *OE.,* mischievous. UNHAP'PILY, ad. unfortunately; miserably; in *OE.,* mischievously. UNHAP'PIED, a. *-pĭd,* in *OE.,* made unhappy. UNHAP'PINESS, n. misfortune; misery; wretchedness.

UNHARASSED, a. *ŭn-hăr'ăst:* not harassed; not fatigued with bodily labor or with care; at ease.

UNHARBORED, a. *ŭn-hâr'bĕrd:* not sheltered.

UNHARDENED, a. *ŭn-hâr'dnd:* not hardened; not made firm or compact; not made obdurate, as the heart.

UNHARDY, a. *ŭn-hâr'dĭ:* not hardy or courageous; not able to endure fatigue; feeble.

UNHARMED, a. *ŭn-hârmd':* unhurt; uninjured.

UNHARMONIOUS, a. *ŭn'hâr-mō'nĭ-ŭs:* not harmonious; incongruous; discordant. UN'HARMO'NIOUSLY, ad.

UNHARNESS, v. *ŭn-hâr'nĕs:* to loose from harness or gear; to divest of armor. UNHAR'NESSING, imp. UNHAR'NESSED, pp.

UNHATCHED, a. *ŭn-hăcht':* not hatched; immature; not disclosed.

UNHAUNTED, a. *ŭn-hânt'ĕd:* not haunted; not frequented or resorted to; solitary.

UNHAZARDED, a. *ŭn-hăz'ĕrd-ĕd:* not hazarded; not put in danger; not exposed to loss.

UNHEALTHY, a. *ŭn-hĕl'thĭ:* not healthy; unsound; sickly. UNHEALTH'FUL, a. injurious to health; unwholesome. UNHEALTH'FULLY, ad. UNHEALTH'ILY, ad. in an unwholesome manner. UNHEALTH'INESS, n. the quality or condition of being unhealthy.

UNHEARD, a. *ŭn-hĕrd':* not heard; not perceived by the ear; unknown to fame; obscure. UNHEARD OF, unprecedented.

UNHEART, v. *ŭn-hârt':* in *OE.*, to discourage; to depress.

UNHEATED, a. *ŭn-hēt'ĕd:* not made hot.

UNHEAVENLY, a. *ŭn-hĕv'n-lĭ:* not heavenly.

UNHEDGED, a. *ŭn-hĕjd':* not surrounded by a hedge; not fenced in.

UNHEEDED, a. *ŭn-hēd'ĕd:* disregarded; neglected. UNHEED'FUL, a. inattentive; careless. UNHEED'FULLY, ad. UNHEED'ING, a. careless; negligent. UNHEED'INGLY, ad. UNHEED'Y, a. *-hēd'ĭ*, in *OE.*, precipitate; sudden.

UNHELE, v. *ŭn-hēl'* [*un*, not; AS. *helan*, to conceal]: in *OE.*, to uncover.

UNHELM, v. *ŭn-hĕlm':* to remove or deprive of a helm or helmet. UNHELMED, pp. a. *ŭn-hĕlmd'*, deprived of a helm or helmet; being without a helmet.

UNHELPED, a. *ŭn-hĕlpt':* having no aid or helper; unsupported. UNHELP'FUL, a. *-fŭl*, giving no assistance.

UNHEPPEN, a. *ŭn-hĕp'pĕn* [*un*, not; AS. *hæp*, fit]: in *prov. Eng.*, ugly; awkward; deformed; misshapen.

UNHEROIC, a. *ŭn'hē-rō'ĭk:* not heroic; not brave.

UNHESITATING, a. *ŭn-hĕz'ĭ-tā-tĭng:* not remaining in doubt; prompt; ready. UNHES'ITATINGLY, ad.

UNHEWN, a. *ŭn-hūn':* not dressed, as stone; rough.

UNHINDERED, a. *ŭn-hĭn'dĕrd:* not hindered or opposed.

UNHINGE, v. *ŭn-hĭnj':* to take from the hinges; to unfix; to loosen; to disorder; to trouble; to unsettle; to incapacitate. UNHING'ING, imp. UNHINGED', pp. loosed from the hinges; unsettled; deranged.

UNHISTORICAL, a. *ŭn'hĭs-tŏr'ĭ-kăl:* not pertaining to or contained in history.

UNHIVE, v. *un-hīv':* to drive from a hive; to deprive of a habitation.

UNHOARD, v. *ŭn-hōrd':* to dissipate or scatter that which has been hoarded.

UNHOLY, a. *ŭn-hō'lĭ:* profane; not holy; not hallowed or consecrated; impious; wicked; impure; not ceremonially purified. UNHO'LILY, ad. in an unholy manner. UNHO'LINESS, n. impiety; an unsanctified state of the heart; profaneness.

UNHONORED, a. *ŭn-ŏn'ĕrd:* not honored; not regarded; not held in high estimation; not celebrated.

UNHOOK, v. *ŭn-hŭk':* to loose or detach from a hook.

UNHOPED, a. *ŭn-hōpt':* not expected; not so probable as to excite hope—usually with *for*, as an *unhoped for* success. UNHOPE'FUL, a. leaving no room for hope. UNHOPE'FULLY, ad.

UNHORSE, v. *ŭn-hŏrs':* to throw or drag from a horse; to cause to dismount. UNHORSED', pp. thrown from a horse. UNHORSING, imp. throwing from a horse; dismounting.

UNHOUSE, v. *ŭn-howz':* to drive from a house or habitation. UNHOUSED', pp. a. expelled from a house or shelter; houseless; destitute of shelter; having no settled habitation.

UNHOUSELED, or UNHOUSELLED, a. *ŭn-how'zĕld* [see HOUSEL]: not having received the Eucharist.

UNHUMBLED, a. *ŭn-hŭm'bld:* not humbled; not ashamed; not contrite in spirit.

UNHUNG: see under UNHANG.

UNHUNTED, a. *ŭn-hŭnt'ĕd:* not hunted; not pursued with hounds, as game.

UNHURT, a. *ŭn-hĕrt':* not injured; not harmed. UNHURT'FUL, a. harmless. UNHURT'FULLY, ad.

UNHUSBANDED, a. *ŭn-hŭz'bănd-ĕd:* without or deprived of a husband; not husbanded or managed with frugality.

UNHUSK, v. *ŭn-hŭsk':* to free from husks. UNHUSKED', a. freed from the husk. UNHUSK'ING, n. the process of freeing grain or other corn from the husk.

UNI-, prefix, *ū'nĭ* [L. *ūnus*, one]: a prefix signifying *only one* or *producing one*.

UNIATS, *ū'nĭ-ăts*, or U'NIATES, *-āts:* members of a Greek or Oriental chh. in communion with the see of Rome and detached from a schismatical parent chh. There are Greek U., Chaldean U., and Armenian U. (see UNITED ARMENIANS). The Uniate Greeks proper employ the Basilian or the Chrysostoman liturgy in Greek. The Uniate Bulgarians, Ruthenians, and Roumanians use the Greek liturgy translated into their own languages. See GREEK CHURCH—*United Greeks*. There are about 12,000 Greek Uniats in the United States—nearly all Ruthenians and Roumanians.

UNIAXIAL, a. *ū'nĭ-ăk'sĭ-ăl* [L. *ūnus*, one, and Eng *axis*]: having but one axis.

UNICELLULAR, a. *ū'nĭ-sĕl'ū-lĕr* [L. *ūnus*, one, and Eng. *cellular*]: composed of one cell.

UNICLINAL, a. *ū'nĭ-klī'năl* [L. *ūnus*, one; Gr. *klinō*, I bend, I lean]: in *geol.*, inclining in one direction; monoclinal.

UNICORN, n. *ū'nĭ-kawrn* [L. *ūnus*, one; *cornu*, a horn]: fabulous animal resembling a horse, but having one horn issuing from its forehead; the sea-unicorn or narwhal, an animal of the whale kind having a long twisted tusk growing out of its nose. U'NICOR'NOUS, a. *-kŏr'nŭs*, one-horned. UNICORN-ROOT, the root of *Helōnĭas dioica*, ord. *Melanthăcĕæ*, used in N. America as an anthelmintic.—The *Unicorn* is mentioned by ancient Greek and Roman authors as a native of India, and is described as being of the size of a horse, but so swift that no horse could overtake it; the body white, but otherwise resembling that of a horse, with one straight horn 1½ to 2 cubits long on the forehead; the base of the horn white, the middle black, the tip red; head red, and eyes blue. The oldest author who describes it is Ctesias, about B.C. 400, physician at the court of Artaxerxes Mnemon. His information, however, was at second-hand. He calls it the Wild Ass (*Onos agrios*). Aristotle briefly mentions it under the name Indian Ass, saying: 'We have never seen a solid-hoofed animal with two horns, and there are only a few of them that have one horn, as the Indian Ass and the Oryx.' Pliny follows Aristotle in the main, but says that the Indian Ass is one-hoofed, and the Oryx two-hoofed. He speaks also of the *Monokeros*, a very fierce animal, with the body of a horse, head of a stag, feet of an elephant, tail of a wild boar, and a single horn. All these accounts are evidently much tinged with fable. Not more credible are those of more modern authors. Lobo, in his *History of Abyssinia*, describes the U. as resembling a beautiful horse; but there is no evidence of the existence of any such animal in that region. Though the descriptions of the U. given by the ancients apply very poorly to the Indian rhinoceros, it is probable that that animal was the origin of them all. In like manner, it is probable that the head of a U. which Barrow saw depicted on the side of a cavern in s. Africa, and the head of a U. described and figured by Campbell in his *Second Journey in S. Africa*, are to be referred to some species of rhinoceros. The word U. is erroneously used in the Authorized Version of the Old Test. (e.g., Deut. xxxiii. 17) to translate the Hebrew *rĕêm*. The Septuagint led the way in this, by using the Greek *Monokeros;* and it has been supposed by many that the animal meant is the rhinoceros. The rĕêm was, however, certainly not a one-horned, but a two-horned animal. In the passage noted above, where the Authorized Version has 'horns of unicorns,' the Revised Version has 'horns of the wild ox.' Elsewhere the alternative 'ox-antelope' is given in the margin of the new version.—For the Sea-Unicorn, see NARWHAL.

The U. is best known as a heraldic charge or supporter. Two unicorns were borne as supporters of the Scottish royal arms for about a century before the union of the crowns; and the sinister supporter of the insignia of the United Kingdom is a unicorn argent, armed,

crined, and unguled or, gorged with a coronet composed of crosses patée and fleurs-de-lis, with a chain affixed, passing between the fore-legs and reflexed over the back, of the last.

UNICOSTATE, a. *ū'nĭ-kŏs'tāt* [L. *ūnus*, one; *costa*, a rib]: in *bot.*, having a single rib or costa in the middle, called the midrib—applied to leaves.

UNIDEAED, a. *ŭn'ī-dē'ăd:* having no idea; inane.

UNIDEAL, a. *ŭn'ī-dē'ăl:* not ideal; real.

UNI-EQUIVALENT, *ū'nĭ-ē-kwĭv'ă-lĕnt:* in *chem.*, applied to an element whose atom is supposed to have only one combining power.

UNIFACIAL, a. *ū'nĭ-fā'shal* [L. *ūnus*, one; *facĭēs*, the face]: having only one face or front surface.

UNIFICATION, UNIFIED: see under UNIFY.

UNIFLORAL, a. *ū'nĭ-flō'răl* [L. *ūnus*, one; *flos* or *flōrem*, a flower]: having but one flower.

UNIFORM, a. *ū'nĭ-fawrm* [F. *uniforme*—from L. *uniformis*, having only one form or shape—from *ūnus*, one; *forma*, shape]: having always the same form, manner, or character; not different; not variable; regular; equable; undeviating; consistent; homogeneous: N. [F. *uniforme*, a uniform]: an official or state dress; the particular style of dress as regards form, fashion, color, etc., which is worn, or prescribed to be worn officially by members of the same service or body, as in the army, navy, police, by railway employés, etc. Compulsory uniforms came in with the institution of standing armies. Soldiers serving with corps were dressed after their own fancy well into the 17th c.; in the Brit. navy, uniforms were not fixed with certainty until the reign of George III Blue is the prevailing color in military and naval uniforms, the police, etc., though ornamented and 'faced' differently in different countries, and in different corps, as well as in different ranks. Scarlet may be said to be (for coats) the prevailing uniform of the Brit army, though some regiments wear other colors (e.g., the rifles green and the artillery blue). Blue is the prevailing color of the German army uniform; in the French army, blue is used for coats and red for breeches. U'NIFORMLY, ad. *-lĭ*, without variation. U'NIFOR'MITY, n. *-fŏr'mĭ-tĭ*, constant resemblance to itself; sameness; unvaried likeness; resemblance in shape and character, as between the corresponding parts of a subject in the fine arts. U'NIFORM'NESS, n. *-nĕs*, the state of being uniform; uniformity. ACTS OF UNIFORMITY, the acts of parliament which regulate the rites and forms of the Church of England, Elizabeth 1559, Charles II. 1662 (see NONCONFORMISTS). U'NIFOR'MITA'RIAN, n. *-fŏr'mĭ-tā'rĭ-ăn*, in *geol.*, one who holds the doctrine that the laws of nature have acted uniformly throughout all time past, and that the appearances in the earth's crust, however difficult of solution, are to be ascribed to the uniform action of those laws, and not to revolutionary operations—the opposite of *catastrophist:* ADJ. of or pertaining to the uniformitarians.

UNIFY, v. *ū'nĭ-fī* [L. *ūnus*, one; *facĭō*, I make]: to reduce to unity or uniformity. U'NIFYING, imp. U'NIFIED, pp. *-fīd:* ADJ. made uniform and of one denomination instead of several; consolidated. U'NIFICA'TION, n. *-fĭ-kā'shŭn*, reduction to unity or uniformity.

UNIGENITURE, n. *ū'nĭ-jĕn'ĭ-tūr* [L. *ūnus*, one; *genĭtus*, pp. of *gigno*, I produce, bring forth]: the state of being the only-begotten. U NIGEN'ITUS, a. *-ĭ-tŭs* [L.]: only begotten.

UNIGEN'ITUS, BULL: celebrated bull issued by Pope Clement XI., which began with the word 'Unigenitus,' and which formally condemned a work written by Quesnel, entitled *Réflexions Morales*, reviving the essential principles of Jansenism (q.v.). The book was at first simply prohibited by a brief of Pope Innocent XI. 1708; but, as it found many patrons, especially the abp. of Paris, Cardinal de Noailles, it was deemed necessary to subject it to a more detailed examination, the result of which was that 101 propositions were extracted from it, and formally condemned 1713 by this famous bull. The mode of condemning these propositions was peculiar, being that technically called *Damnatio in globo.* The whole body of propositions was condemned as 'heretical, 'false,' 'rash,' 'scandalous,' 'offensive to pious ears,' etc.; without, at the same time, any particular propositions being pointed out as deserving any one of these specific forms of censure. This circumstance, with others, gave rise to much controversy, and to a prolonged opposition to the bull. De Noailles and other bishops refused to accept it unless with certain qualifications; on the contrary, Louis XIV. insisted on unconditional acceptance; but on the death of Louis, the regent (Duke of Orleans) having given his countenance to the opponents of the bull, the resistance was persisted in; and eventually a declaration was put forth, 1717, by four bishops, appealing from the pope to a general council. This appeal was condemned by the pope, nor was it countenanced even by the regent; but a more modified appeal, 'from the pope ill-informed to the pope better-informed,' was afterward published by De Noailles, which obtained many adherents, and by which the opposition was kept alive till the end of the pontificate of Clement XI. 1721, and even under his successors, Innocent XIII. and Benedict XIII. It was not till 1730 that, after the formal registration of the Bull Unigenitus by the parliament of Paris, the party thus created in France, and known under the name of 'Appellants,' received its final condemnation from the civil authority, after which it gradually died out, though some relics of it are still traceable, even after all the storms of the Revolution, in the so-called 'Petite Église.' See GALLICAN CHURCH.

UNIGENOUS, a. *ū-nĭj'ĕ-nŭs* [L. *ūnus*, one; *genus*, a kind]: of one or the same kind or genus.

UNIJUGATE, a. *ū-nĭj'ū-gāt* [L. *ūnus*, one; *jugum*, a yoke]: in *bot.*, applied to a pinnate leaf having one pair of leaflets.

UNILABIATE, a. *ū'nĭ-lā'bĭ-āt* [L. *ūnus*, one, and *labium*, a lip]: in *bot.*, having one lip only.

UNILATERAL, a. *ū'nĭ-lăt'ĕr-ăl* [L. *ūnus*, one; *latus*, a side, *latĕris*, of a side]: having but one side; arranged on one side or turned to one side.

UNILITERAL, a. *ū'nĭ-lĭt'ĕr-ăl* [L. *ūnus*, one; *litĕra*, a letter]: consisting of one letter only.

UNILLUMINATED, a. *ŭn'ĭl lō'mĭ-nā-tĕd:* dark; ignorant.

UNILOCULAR, a. *ū'nĭ-lŏk'ū-lĕr* [L. *ūnus*, one; *locŭlus*, a little place—from *locus*, a place]: having a single division or cavity; one celled.

UNIMAGINABLE, a. *ŭn'ĭm-ăj'ĭn-ă-bl:* not to be conceived. UN'IMAG'INABLY, ad. UN'IMAG'INATIVE, a. not imaginative. UN'IMAG'INED, a. not conceived.

UNIMITATED, a. *ŭn-ĭm'ĭ-tā-tĕd:* not imitated.

UNIMPAIRED, a. *ŭn'ĭm-pärd':* not impaired; not enfeebled

UNIMPASSIONED, a. *ŭn'ĭm-păsh'ŭnd:* not endowed with passions; cool; calm; not vehement.

UNIMPEACHABLE, a. *ŭn'ĭm-pēch'ă-bl:* that cannot be accused; free from stain or fault. UN'IMPEACH'ABLENESS, n. *-nĕs*, the state or quality of being unimpeachable. UN'IMPEACHED', a. not charged or accused.

UNIMPEDED, a. *ŭn'ĭm-pē'dĕd:* not impeded or hindered.

UNIMPLORED, a. *ŭn'ĭm-plōrd':* not solicited.

UNIMPORTANT, a. *ŭn'ĭm-pawrt'ănt:* not important; insignificant. UN'IMPORT'ANCE, n. *-ăns*, want of importance.

UNIMPORTUNED, a. *ŭn-ĭm'pŏr-tūnd':* not importuned.

UNIMPOSING, a. *ŭn'ĭm-pō'zĭng:* not imposing; not adapted to impress forcibly.

UNIMPRESSIBLE, a. *ŭn'ĭm-prĕs'sĭ-bl:* not impressible. UN'IMPRESSED', a. not impressed; not awakened or aroused; not fixed deep in the mind. UN'IMPRES'SIVE, a. not forcible; not adapted to awaken the passions. UN'IMPRES'SIVELY, ad.

UNIMPROVABLE, a. *ŭn'ĭm prôv'ă-bl:* not capable of improvement by culture or tillage. UN'IMPROVED', a. not improved; not advanced in knowledge or excellence; not profited by; not tilled. UN'IMPROV'ING, a. not tending to advance or instruct.

UNIMUSCULAR, a. *ū'nĭ-mŭs'kū-lĕr* [L. *ūnus*, one; *muscŭlus*, a muscle]: applied to a bone having one muscle only, and one muscular impression.

UNINCLOSED, a. *ŭn'ĭn-klōzd':* not inclosed.

UNINCORPORATED, a. *ŭn'ĭn-kŏr'pō-rā-tĕd:* not united in one body; not blended.

UNINCUMBERED, a. *ŭn'ĭn-kŭm'bĕrd:* not burdened; free from mortgage or other incumbrance or charge.

UNINDORSED, a. *ŭn'ĭn-dŏrst':* not indorsed or assigned.

UNINFECTED, a. *ŭn'ĭn-fĕkt'ĕd:* not infected; not contaminated by foul air; not corrupted. UN'INFEC'TIOUS, a. *-fĕk'shŭs*, not foul; not capable of communicating disease.

UNINFESTED, a. *ŭn'ĭn-fĕst'ĕd:* not infested.

UNINFLAMED, a. *ŭn'ĭn-flāmd':* not inflamed; not set on fire; not highly provoked. UN'INFLAM'MABLE, a. not inflammable; that cannot be set on fire.

UNINFLUENCED, a. *ŭn-ĭn'flū-ĕnst:* not influenced; not persuaded or moved by others; acting freely. UNIN'-FLUEN'TIAL, a. not possessing influence.

UNINFORMED, a. *ŭn'ĭn-fawrmd':* not instructed; untaught; not suffused with life or color.

UNINHABITABLE, a. *ŭn'ĭn-hăb'ĭ-tă-bl:* unfit to be dwelt in by men. UN'INHAB'ITED, a. not dwelt in by men; without inhabitants.

UNINITIATED, a. *ŭn'ĭn-ĭsh'ĭ-ā-tĕd:* not initiated.

UNINJURED, a. *ŭn-ĭn'jūrd:* not hurt; suffering no harm.

UNINSCRIBED, a. *ŭn'ĭn-skrībd':* not inscribed; not marked with letters or characters.

UNINSPIRED, a. *ŭn'ĭn-spīrd':* not inspired; not having received any supernatural instruction or illumination.

UNINSTRUCTED, a. *ŭn'ĭn-strŭkt'ĕd:* not educated; not furnished with instructions or directions. UN'INSTRUC'-TIVE, a. not conferring improvement.

UNINSULATED, a. *ŭn-ĭn'sū-lā-tĕd:* not insulated; not separated or detached.

UNINSURED, a. *ŭn'ĭn-shŏrd':* not secured against loss, as by fire, shipwreck, or the like.

UNINTELLECTUAL, a. *ŭn-ĭn'tĕl-lĕk'tū-ăl:* not intellectual.

UNINTELLIGENT, a. *ŭn'ĭn-tĕl'lĭ-jĕnt:* lacking or deficient in intelligence or understanding. UN'INTEL'LI-GENCE, n. *-lĭ-jĕns*, lack of intelligence; stupidity. UN'IN-TEL'LIGIBLE, a. *-lĭ-jĭ-bl*, that cannot be understood. UN'-INTEL'LIGIBLY, ad. *-blĭ.*

UNINTENDED, a. *ŭn'ĭn-tĕnd'ĕd:* not intended.

UNINTENTIONAL, a. *ŭn'ĭn-tĕn'shŭn-ăl:* not intentional; done or happening without design. UN'INTEN'-TIONALLY, ad. without design.

UNINTERESTED, a. *ŭn-ĭn'tĕr-ĕst-ĕd:* not having the mind engaged; having nothing at stake. UNIN'TERESTING, a. not capable of exciting or attracting the mind. UNIN'-TERESTINGLY, ad. *-lĭ.*

UNINTERPOLATED, a. *ŭn'ĭn-tĕr'pō-lā-tĕd:* not interpolated.

UNINTERPRETED, a. *ŭn'ĭn-tĕr'prĕ-tĕd:* not interpreted or explained.

UNINTERRED, a. *ŭn'ĭn-tĕrd':* not buried.

UNINTERRUPTED, a. *ŭn'ĭn-tĕr-rŭp'tĕd:* not interrupted; not broken; unceasing; not disturbed by intrusion or by another occupation. UNIN'TERRUP'TEDLY, ad.

UNINTRENCHED, a. *ŭn'ĭn-trĕnsht':* not protected by a ditch and parapet.

UNINTRODUCED, a. *ŭn'ĭn-trō-dūst':* not introduced; not duly conducted or ushered into a place; not brought into notice.

UNINURED, a. *ŭn'ĭn-ūrd':* not hardened by use or practice.

UNINVENTED, a. *ŭn'ĭn-vĕnt'ĕd:* undiscovered. UN'INVEN'TIVE, a. *-tĭv,* destitute of invention.

UNINVESTED, a. *ŭn'ĭn-vĕst'ĕd:* not placed in possession, as of an office; not laid siege to; not laid out in some investment.

UNINVESTIGATED, a. *ŭn'ĭn-vĕs'tĭ-gā-tĕd:* not searched into.

UNINVITED, a. *ŭn'ĭn-vī'tĕd:* not invited; not requested; unbidden; not solicited. UN'INVI'TING, a. not enticing; not alluring; ungracious.

UNINVOKED, a. *ŭn'ĭn-vōkt':* not invoked.

UNIO, n. *ū'nĭ-ō* [L. *unĭō,* unity, the number one—from *ūnus,* one]: genus of bivalves containing the river-mussels; a member of this genus or of the family *Unionidæ.* UNIONIDÆ, n. plu. *ū'nĭ-ŏn'ĭ-dē,* the family of river-mussels found in ponds and streams (see FRESHWATER MUSSEL).

UNION: town, Hudson co., N. J.; on the Hudson river, opposite New York, 1 m. n. of Hoboken.—Pop. (1880) 5,849; (1890) 10,643; (1900) 15,187.

UNION, n. *ūn'yŭn* or *ū'nĭ-ŭn* [F. *union,* union—from mid. L. *unĭō* or *unĭōnem,* a union—from L. *ūnus,* one: It. *unione*]: the act of joining two or more things into one in order to form a new body; concord; agreement; intimate connection; that which is united or made into one; a combination, confederation, or league: in particular, (*a*) a permanent combination among workmen engaged in the same occupation or trade, instituted for mutual protection and assistance in matters of dispute between them and their employers (see TRADE-UNION); (*b*) in England and Ireland, several parishes united for the joint management of their poor; (*c*) the work-house maintained by such a combination of parishes: a fabric of different materials, as cotton and wool, or of silk or linen and wool: that part of a flag which occupies the upper corner next the staff and is distinguished from the rest by color or pattern. UN'IONISM, n. *-ĭzm,* the system of combination among workmen engaged in the same occupation or trade. UN'IONIST, n. *-ĭst,* one who advocates or promotes union; a member of a trade-union. UN'IONIS'TIC, a. *-ĭs'tĭk,* of or pertaining to unionism; tending toward union. UNION-CORD, a round white cord made of mixed cotton and linen threads. UNION-JOINT, a joint in the form of the letter T for uniting pipes of iron, etc. UNION BY THE FIRST INTENTION, in *surg.,* the growing to-

gether of the opposite surfaces of a recent wound, when brought into contact, without suppuration. UNION DOWN, adverbial phrase, meaning 'with the union down,' denoting the position of a flag flying upside down as a signal of distress.—SYN. of 'union': junction; concord; coalition; unity; combination; alliance; connection.

UNION, LEGISLATIVE, of Great Britain and Ireland: the incorporation of England and Scotland, 1707, and of Ireland with both, 1801, for legislative purposes. The crowns of England and Scotland were united under one sovereign on the accession of James VI. of Scotland to the English throne as James I. 1603; each country, however, continuing to be governed by laws enacted by its respective parliament, the interest of one often coming into collision with that of the other. After various fruitless proposals for closer connection of the countries, the Scotch were prevailed on, 1702, to send 20 commissioners to London to confer with 23 English commissioners on the terms of a union. Their proceedings, after being broken off, were resumed 1706. The Scottish commissioners were at first in favor of a mere federal union, and objected to the proposed assimilation of customs, excise, and regulations of trade; but a majority were at last brought over to the views of the English commissioners; and the minority, with one exception, yielded. The Union, popular in England, gave great dissatisfaction in Scotland, being regarded by the bulk of the community as a surrender of national independence to a powerful rival. Addresses against it were presented from all quarters, and in some places the people rose in arms, forming regiments of horse and foot to oppose it. The treaty, however, was ratified by the parliaments of both countries, and the union effected 1707, May 1. Its principal conditions were the incorporation of England and Scotland into the United Kingdom of Great Britain, the succession of whose monarchs was to be the same as that of England. There was to be one parliament, in which the peers of Scotland would be represented by 16 of their number elected to each parliament, and 45 Scotch members were to sit in the house of commons. All rights and privileges were to be communicated between the subjects of both kingdoms, unless when otherwise agreed. The Episcopal Church was confirmed in England, and the Presbyterian in Scotland. Scotland was to retain her courts of session and justiciary, and to have a separate seal for private rights and grants. While the parliament was to raise £2,000,000 by land-tax, Scotland would contribute £48,000 of that sum. The laws of trade, customs, and excise in Scotland were to be assimilated to those of England, and the coinage, weights, and measures of the two countries were to follow a uniform standard. In other matters the laws of Scotland were to remain in force, but might be altered by the parliament of Great Britain. The separate privy council of Scotland, which the Act of Union left untouched, was abolished the following year.

Ireland remained a distinct kingdom till 1801, when it was united with Great Britain into the United Kingdom

of Great Britain and Ireland (q.v.). By the terms of the union, the separate parliament of Ireland was abolished, and Ireland was represented in the parliament of the United Kingdom by 4 lords spiritual and 28 lords temporal in the house of lords, and 120 members of the house of commons. Power was reserved to the sovereign to create one peer of Ireland for every three peerages that might become extinct; and when the peerage of Ireland became reduced to 100, to create one peerage for each one that became extinct, so as to keep the peerage of Ireland up to 100, besides those Irish peers who are peers also of England or of Great Britain. The churches of England and Ireland were united into one Prot. Episc. Church. The inhabitants of Ireland were placed on the same footing as those of Great Britain in respect of trade and navigation, and in all treaties with foreign powers; and the law-courts of Ireland were to continue, subject to the regulations of parliament—writs of error and appeals being decided by the house of lords of the United Kingdom.

UNION CHRISTIAN CHURCH, THE: denomination of Christians, organized at Columbus, O., 1865; merged with the former 'Christian Connection' 1886—these united denominations being now known as 'Christians' (see CHRISTIANS, THE).

UNION COLLEGE: see UNION UNIVERSITY.

UNION-JACK [from F. *jacque*, surcoat or jacket, charged with the red cross of St. George, worn by English soldiers in the middle ages (see JACK)]: national banner of the United Kingdom of Great Britain and Ireland; formed out of a combination or union of the crosses of St George (argent, a cross gules), of St. Andrew (azure, a saltire argent), and of St. Patrick (argent, a saltire gules), representing England, Scotland, and Ireland respectively. The first union-jack, introduced by royal proclamation 1606, three years after the union of the Scottish with the English crown, combined the crosses of St. George and St. Andrew; and was by royal proclamation 1707, July 28, constituted

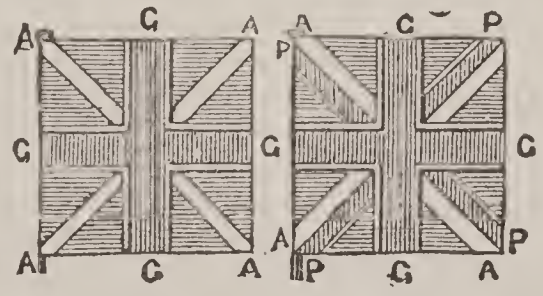


Fig. 1. Fig. 2.

G, St. George's Cross; A, St Andrew's Cross; P, St. Patrick's Cross.

the national flag of Great Britain (fig. 1). On the union of Ireland with Great Britain, a new union ensign was devised, in which the cross of St. Patrick was introduced, with its four limbs edged with white on one side: this awkward specimen of heraldry forms the present union ensign (fig. 2)

UNION THEOLOGICAL SEMINARY: institution in New York for educating candidates for the ministry of the Presb. Chh. It was opened 1836, chartered 1839. Till 1884 the seminary occupied a building in University Place; then it removed to the imposing group of structures on Park avenue specially erected for it. The U. T. S. is governed by a board of trustees, members of the Presb. Chh., one-half of whom are ministers, the other half laymen. The professors (who all are ministers of the Presb. Chh.), are required to subscribe to the Westminster confession of faith and to declare their acceptance *ex animo* of the ecclesiastical polity of Presbyterianism. The professors are (1901-2) 17 in number; there are also instructors in sacred music and in elocution. Subscription to the Presb. standards is not required of students: the institution is open to students of every Christian evangelical denomination. The conditions of admission are: proved good standing in an evangelical chh., and evidence that the candidate has received a regular collegiate education; but a candidate may demonstrate on examination by the faculty his competent acquaintance with the subject-matters of a college course, and may be admitted though he have never studied in college. The number of students (1901-2) was 119. The grounds and buildings are valued at more than $500,000; productive funds $1,400,000. Instruction is gratuitous. The annual rental of a room in the seminary building with light and heat is $35. There are in the lib. 77,275 vols., 50,000 pamphlets, and about 200 MSS. The nucleus of the library was about 13,000 vols. forming the private library of Leander Van Ess, in which are contained 430 vols. printed between 1469 and 1510, 1,246 pieces of Reformation literature in original editions, 4,209 works of ecclesiastical history, writings of the Fathers, etc., and 200 editions of the Bible in Latin and in German.—This seminary, though affirming the regular doctrinal standards of the Presb. Church, is regarded as giving them a liberal interpretation.—Upon the controversy that arose about Dr. Briggs (q.v.) in 1892, the seminary rescinded the concession formerly made to the gen. assembly of a veto on the appointment of its professors, and the gen. assembly thereupon removed the seminary from the list of institutions under its approval, and instructed boards of education not to grant aid to candidates for the ministry attending institutions not approved by the gen. assembly. The seminary therefore, while virtually Presb., stands officially as an undenominational or independent institution. The pres. is Charles Cuthbert Hall, D.D.

UNIONTOWN, *ūn'yŭn-town:* borough in Fayette co., Penn.; on the Pennsylvania and the Baltimore and Ohio railroads; 72 m. s.-by-e. of Pittsburgh. It is in an agricultural, limestone, coke, coal, and iron-ore region, and was formerly known as Beesontown, from Jacob Beeson, who laid it out 1783. There are one daily and 4 weekly newspapers; manufactories of flour, cement, brick, foundry products, sashes and blinds, and tanned leather; and large shipments of grain and live-stock.—Pop. (1880) 3,265; (1890) 6,359; (1900) 7,344.

UNION UNIVERSITY (formerly UNION COLLEGE): institution of learning at Schenectady, N. Y., founded 1795, by the regents of the Univ. of the State of N. Y., as 'Union College.' The nucleus of the foundation was the 'Schenectady Academy,' a school established under the patronage of the Reformed Dutch Chh. 1785. Repeated efforts were made after 1792 to obtain for the academy a college charter; but the legislature refused to grant it till 1795, when the managers of the academy gave guarantees that the proposed college should be free from the taint of sectarianism. By the terms of the charter, the faculty of the college were invested with all the rights and privileges theretofore enjoyed by Columbia College, in the city of New York, and empowered to confer 'such degrees as are usually granted by any or either of the universities of England.' There were at first 24 trustees, later only 21, and some of these were to be certain officers of the state govt. *ex officio.* The enlargement of the college into a university was effected by charter 1873, four other institutions—viz., schools of law, pharmacy, and medicine, and an astronomical observatory—being united with the college. These additional departments have their seat at Albany. The first pres. of Union College was the Rev. John Blair Smith, D.D., Presb.; he was succeeded by the Rev. Jonathan Edwards, D.D., Congl.; to whom succeeded the Rev. Jonathan Maxey, D.D., Bapt. In 1804 Union College obtained for its head the Rev. Eliphalet Nott, D.D., LL.D., Presb., who held the presidency 48 years, and who even after his resignation 1852, till his death 1866, was the guiding genius of the institution. During his long tenure of office, Dr. Nott held his college in the foremost rank of educational institutions in America (see NOTT, ELIPHALET). Dr. Nott was succeeded in the presidency by the Rev. Laurens P. Hickok, D.D., LL.D., who retired 1868. A layman, Ira Harris, was then (nominally) pres. for a time; to him succeeded the Rev. Charles A. Aiken, D.D., PH.D. Union chose a pres. from among her own alumni first in 1871, when the Rev. Eliphalet Nott Potter, D.D., LL.D., Prot. Episc., grandson of Eliphalet Nott, was elected. Dr. Potter retired 1884. Then till 1888 the college had no formally elected pres.; but in that year the trustees chose for head of the univ. Harrison Edwin Webster, LL.D., an alumnus and former professor.—U. U. is fittingly housed in 'North College' and 'South College,' two structures 4 stories high, and each 200 ft. front, with wings of less height, but 300 ft. long, extending rearward. These edifices are L-shaped and stand on a terrace, with the extremities of the short limbs of the L's turned toward each other, but 200 ft. or more apart; in the mid-space are residences of professors; the long limbs inclose the campus on two sides; in the rear of the campus is a 16-sided stone structure, 84 ft. in diameter, capped with a dome that rises 120 ft. above the floor: it is a costly building, lavishly ornate, and is a memorial of Pres. Nott. There are several other structures, as the library building, gymnasium, Swiss cottages, etc. The vols. in the library

number 7,400. There is a well-appointed physical laboratory; there are also valuable natural-history collections—of shells, birds, minerals, etc. The museum of engineering models and implements represents the entire history of practical engineering. The courses of study conducted in the college proper are the classical, the scientific, and the engineering. The other university courses—those of law, pharmacy, and medicine—are given at Albany in the affiliated schools. The pres. of the univ. (1902) is Andrew V. V. Raymond, D.D. In 1902 the profs. and instructors in the collegiate dept. numbered 20; students 187. Its endowment funds amounted to $1,700,000; its annual revenue to $97,500; scholarships 49. Value of scientific appar. $104,300; of grds. and bldgs. $1,069,550.

UNIPAROUS, a. *ū-nĭp'ă-rŭs* [L. *ūnus*, one; *parĭō*, I bear or bring forth]: producing only one at a birth; in *bot.*, having a cymose inflorescence in which the primary axis produces one bract, and so on, the cyme being elongated according to its development; having a scorpioidal cyme.

UNIPED, a. *ū'nĭ-pĕd* [L. *ūnus*, one; *pes* or *pĕdem*, a foot]: having only one foot.

UNIPETALOUS, a. *ū'nĭ-pĕt'ă-lŭs* [L. *ūnus*, one, Gr. *pĕtălon*, a leaf]: having a corolla consisting of one petal, which depends upon the abortion or non-development of others—to be distinguished from Monopetalous (q.v.).

UNIPOLAR, a. *ū-nĭp'ŏ-lĕr* [L. *ūnus*, one; *pŏlus*, a pole]: in *anat.*, having a single pole, as certain ganglionic nerve-cells; having but one radiating process.

UNIQUE, a. *ū-nēk'* [F. *unique*, sole, singular—from L. *unĭcus*, only, sole—from *ūnus*, one]: sole; only; without an equal; without another of the same kind: N. anything unparalleled or without an equal. UNIQUE'LY, ad. *-lĭ.* UNIQUE'NESS, n. *-nĕs*, the state of being unique.

UNIRADIATED, a. *ū'nĭ-rā'dĭ-ā-tĕd* [L. *ūnus*, one; *radĭus*, a ray]: having one ray.

UNIRRITATED, a. *ŭn-ĭr'rĭ-tā-tĕd:* not provoked or angered.

UNISEPTATE, a. *ū'nĭ-sĕp'tāt* [L. *ūnus*, one; *septum*, a hedge]: in *bot.*, having but one septum

UNISERIATE, a. *ū'nĭ-sē'rĭ-āt*, or UNISE'RIAL, a. *-rĭ-ăl* [L. *ūnus*, one; *sĕrĭēs*, a row, a series]: in *bot.*, arranged in a single line or row. UN'ISER'IATELY, ad.

UNISEXUAL, a. *ū'nĭ-sĕks'ū-ăl* [L. *ūnus*, one, and Eng. *sexual*]: of a single sex—applied to plants having separate male and female flowers.

UNISON, n. *ū'nĭ-sŭn* [L. *ūnus*, one; *sŏnus*, a sound]: sameness of sound; sounds precisely equal in respect to acuteness or gravity; two or more sounds of the same name produced at the same time; agreement; concord: ADJ. sounding alone. UNISONANT, a. *ū-nĭs'ō-nănt* [L. *sonans* or *sonan'tem*, sounding]: having the same degree of gravity or acuteness. UNIS'ONANCE, n. *-năns*, accordance of sounds. UNIS'ONOUS, a. *-nŭs*, sounding in harmony.

UNIT, n. *ū'nĭt* [L. *unĭtas*, oneness, sameness—from *ūnus*, one: F. *unité;* It. *unità*]: one; a single person or thing; the least whole number; a certain dimension or magnitude assumed as a standard of measure—thus, in English-speaking countries the inch is the *unit* of length.

UNITARIAN, n. *ū'nĭ-tā'rĭ-ăn* [L. *unĭtas*, oneness—from *ūnus*, one]: one who denies the doctrine of the Trinity, ascribing true and proper divinity to God the Father only: ADJ. pertaining to. U'NITA'RIANISM, n. *-izm*, the doctrines of those who deny the deity of Christ as being inconsistent with the unity of God, and who deny the personality of the Holy Spirit.—*Unitarians*, maintaining that God exists in one person only, deny his tri-personality (see TRINITY). In its general sense, the name of course includes the Jews and Mohammedans as well as those Christians who deny the doctrine of the Trinity, and in this sense there have been Unitarians from the earliest period of ecclesiastical history. Until the middle of the 2d c. there seems to have been no controversy on the subject; but from that time to the end of the 3d c., a succession of eminent teachers maintained, against the ecclesiastical doctrine of the Logos, the undivided unity—or, as they expressed it, the *Monarchy*—of God. From their use of this word, they are known in ecclesiastical history as the Monarchians: see MONARCHIANISM; and its references. There are generally understood to have been two classes of them—first, those who taught that Christ was God in a sense so absolute that it was the Father who became man, and was born and suffered; hence these were called by their opponents Patripassians (q.v.): secondly, those who taught that Christ was in nature a mere man, but exalted above all other prophets by the superior measure of divine wisdom with which he was endowed; thus this class corresponded more nearly with modern Unitarians. About the middle of the 3d c., the famous Sabellius (q.v.) taught the doctrine of a trinity not of persons, but only of divine modes or manifestations—a view essentially like those of the first class of Monarchians. The other class was represented by Theodotus, Artemon, and especially Paul of Samosata, Bp. of Antioch, who was eventually deposed for his heresy. Beryllus, Bp. of Bostra, in Arabia, who is said to have been convinced of his error by Origen, seems, from the single sentence which records his teaching, to have belonged to this class.

The great theological struggle in the 4th c. between the Arians and the Athanasians may be regarded as another phase of the Unitarian controversy, inasmuch as Arius held that the Son, though brought into existence before all worlds, and the highest of all created beings, was a created being—thus denying his consubstantiality with the Father: see ARIUS: ATHANASIUS. We now pass to the post-Reformation period.

With the great stir of thought at the Reformation came question and denial of the doctrine of the Trinity—and this even before the time of the Socini (see SOCINUS). Notable among disputants on this theme was the Spaniard

Michael Servetus (q.v.). Indeed, the Unitarian doctrine was quite widely diffused. Under the influence of the elder Socinus, Unitarianism gained adherents in Venetia; but Poland and Transylvania became its strongholds. In Poland the nobility favored it, and the Unitarian refugees from other countries found welcome; and in the reign of Sigismund II. (1548–1572) this party of reformers was strong enough to form a separate church. Somewhat later, Poland was the field of labor of the younger Socinus (q.v.), and Unitarianism flourished there till the middle of the 17th c., when, under John Casimir, who before his elevation to the throne had been a cardinal and a Jesuit, it was extirpated by force. In Transylvania the Unitarians have maintained their existence till the present day. Under the influence of George Blandrata and Francis Davidis (1565), large numbers, including the king himself, embraced the new opinions. But their progress was hindered by the usual division between radical and conservative views regarding worship to be rendered to Christ. After the incorporation of Transylvania with the Austrian empire 1690, the Unitarians were despoiled by the Rom Catholics of all their churches and church property, largely prevented from building new churches, and by degrees excluded from all govt. offices. With the accession of Joseph II. came protection and larger liberty, and even indemnity for former outrages. The Unitarians of Transylvania number about 55,000, in a church-organization with a bishop at its head. They have excellent colleges and schools. Their Unitarianism has now become largely conformed to the modern type in England and in the United States.

In England, Unitarian opinions were later in making their appearance than on the continent, though there were a few early cases of individuals persecuted for such teachings. But during the reign of James I. continental Socinianism began to gain adherents, and by 1705 had so increased that Palmer—referring to the Church of England—spoke of 'troops of Unitarian and Socinian writers.' Many eminent men of the time, including Milton, Locke, and Newton, and, in the next century, Lardner, are claimed by the Unitarians as showing more or less sympathy with their views. After the passing of the Toleration Act 1689, whereby Nonconformity was made legal, the way was prepared for that gradual change by which the orthodoxy of the English Presb. Church passed by gradual change first into Arianism, then into full Unitarianism. It was at this time that most of the old Presb. chapels were founded; and the trusts (unlike those of the Congregationalists and Baptists) being open—i.e., the use of the funds not committed to any doctrinal system—there was no legal obstacle to the adoption of whatever new opinions should approve themselves to their conscience: see PRESBYTERIAN CHURCH IN ENGLAND. It should be understood, however, that the *doctrinal* articles of the established church were in no sense or degree the cause of the original separation from that church of those who passed into the Presb. connection. The doctrinal change was gradual and slow

During the latter half of the 18th c. Dr. Priestley (q.v.) appeared as the champion of the humanitarian view of Christ's nature; and by the influence of his writings secured the more open advocacy of that doctrine. In 1773 Dr. Lindsey resigned his charge in the Church of England, and became pastor of the Unitarian congregation of Essex street, London—an epoch in English Unitarianism. In 1813 the Unitarians were placed by law on a par with other dissenters. The Unitarians of England and Wales are purely congregational in church government, their only organ for combined action being the Brit. and Foreign Unit. Assoc., meeting annually in London. Their principal place of education is Manchester New College, London, which is, however, unsectarian. They have also a missionary college in Manchester; and the Presb. College, Caermarthen, educates Independent and Unitarian ministers. They have at present about 300 chapels and 80 mission stations. Influenced by the writings of Channing, and by such thinkers as James Martineau, J. J. Tayler, and others, the English Unitarianism of the last half of the 19th c. has taken on a type more emotional and spiritual and less dogmatic than that which characterized the system advocated by Priestley and his followers.

In Scotland the religious atmosphere has never been favorable to Unitarianism: there are only a few scattered Unitarian congregations.

In Ireland the history of Unitarianism is intimately connected with that of Presbyterianism. It flourishes principally in the north of the island, where there is a strong infusion of Scotch blood, and where Rom. Catholicism has the least influence. There are about 10,000 Unitarians in Ireland. The Unitarians of Ireland are Presbyterians in fact as well as in name.

In the principal colonies of Great Britain there are a few Unitarian churches.—Unitarian sentiments, under the names Liberal Christianity, Rationalism, etc., are more or less widely diffused—often without organization—in Great Britain, France, Switzerland, Germany, and Holland: in some of the old continental churches, Rationalism, involving Unitarian views, has large influence.

Unitarianism in the United States has passed through much the same phases as in Great Britain. The first preacher of Unitarianism in the American colonies of England was probably Ebenezer Gay (1696–1787), pastor of Hingham, Mass., by many styled 'father of American Unitarianism.' James Freeman, D.D. (1759–1835), rector of the King's Chapel, Boston (established for an Episcopal church), excised from the Book of Common Prayer all mention of the Divine Trinity, and all expressions implying divine worship of Jesus; from 1783 King's Chapel was distinctly Unitarian. Harvard College strongly favored the Unitarian cause; the pres. and fellows chose for prof. of divinity, 1805, Dr. Henry Ware (1764–1845), a confessed Unitarian. The churches in Boston and its near vicinity felt the influence from Harvard, and many became Unitarian; but in other regions of New England the changes

were only few and scattering. The change was in many cases facilitated by the fact that the law of Mass. gave right of voting in a 'parish' to members of the congregation as well as to the members of the church (or communicants). The parish, having the power to vote in settling a minister, and having also legal control of all funds and property, in many cases acted irrespective of the church in transferring the whole property and corporate existence of the institution. The ancient church at Plymouth, Mass., became Unitarian 1801. The division which has since become so clearly marked between the evangelical Congl. churches in New England and the Unitarian churches was developed gradually through a series of years by a withdrawal of fellowship by church after church—not by any formal denominational act of expulsion by the large evangelical majority, nor by any formal general act of secession by those who adopted the new views. Since the separation became distinct and final, the increase in the number of Unitarian churches in New England has not been great. The denomination there, as elsewhere, is notable for culture and for its attention to educational and philanthropic interests. Dr. William Ellery Channing (q.v.) promulgated at the ordination of Jared Sparks, 1819, the 'Unitarian declaration of independence;' and was thereafter the recognized leader of Unitarianism in the United States and England. The American Unitarian Assoc. was formed 1825. The Unitarians have a divinity school at Cambridge, Mass., and a theol. school at Meadville, Penn. A report of the assoc. (1889) declares that in the United States, in 25 years next preceding, the Unitarian churches had increasedf rom less than 250 to nearly 400. In 1897 there were reported 457 churches and 351 Sunday schools. The denomination publishes no reports of membership, of church expenses, or of benevolent gifts. But the total number of members or adherents is estimated at about 75,000; and it is known that they give liberally in general charity. The American Unitarian Assoc. became incorporated 1847, and was made a delegate body 1859: it is the chief organ of denominational activity. A body cognate with it was formed in 1865, the National Conference of Unitarian and Other Christian Churches: it meets biennially, and issues an address to the churches on the state of the denomination, with advice as to plans and methods of work. The National Alliance of Unitarian and Other Christian Women is efficient for denominational interests through its many local branches. Anti-Trinitarian opinions are understood to be held by many Universalists and Hicksite Quakers.

The following is a brief sketch of the theological opinions held by Unitarians.

The early Socinians (according to the Racovian Catechism, from which this outline of their views is drawn) assumed the sufficiency of Scripture, or rather of the New Test., which, they held, had, for all matters of faith, superseded the Old. According to their system, Christ was a true man, but con-

ceived of the Holy Spirit; and on account of the divine power which he has received from the Father, and his exaltation as head over all things, he is to be worshipped. The Holy Spirit is not a person, but a divine influence. The Socinians rejected the doctrine of original sin. Man, they taught, was created with a mortal nature, but by special gift of God was endowed with a conditional immortality. He was created innocent, but not positively righteous. The gift of immortality he forfeited by disobedience. The fall of Adam, however, being a single act, could not deprave his own nature, much less that of his posterity; and, in the latter, death was not a consequence of the fall, but was simply the condition of birth and life. Thus the actual consequence of Adam's fall was not any radical corruption of human nature, but rather a moral deterioration, producing, with repeated acts of disobedience, an increasing tendency to sin. Man, after the fall, retained his free will. Christ's merits consisted principally not in his death, but in his life, teachings, and example. His death was not an atoning sacrifice, nor had it any vicarious efficacy, but was simply a confirmation of God's will, and the seal of the new covenant. Christ died for our sins—first, that all sinners might thus have assurance of forgiveness and of eternal life; secondly, that they might be drawn to seek through him alone remission of their sins; and thirdly, that God might thus testify His boundless love to the human race, and might reconcile it to Himself. But the crucifixion was important chiefly as preparing the way for the great crowning miracle of the resurrection, in which is the central point of the Christian scheme. By this he confirmed his doctrine of immortality, and prepared for his ascension into heaven, where he now fills the office of our great High-Priest. Predestination in this system means the decree of God, made before the foundation of the world, that they who believed and were obedient should be saved, and that they who believed not and were disobedient should be lost. Justification takes place when God pardons our sins and gives us eternal life. The Socinians regarded the 'sacraments' as simply external signs testifying to Christian faith. Hence they deemed infant baptism irrational as well as unscriptural, but thought that a custom so venerable should be tolerated.

The systematic theology of the early Socinians is in England and the United States a thing of the past; indeed the modern Unitarians, though more or less influenced by their continental brethren of the Reformation period, have with the latter no direct historical connection. They seem rather to have arrived at independent conclusions, through their 'rational' interpretation of Scripture, and their consistent rejection of authority in matters of faith. The Unitarians of the present day, like almost all Christian sects, are divided into two classes—conservative and progressive. The former adopt the old rule of the sufficiency of Scripture, though with the qualifications resulting from the scientific criticism of the Bible. The most conservative Unitarians, e.g., would not contend for the literal truth of the first

chapter of Genesis, nor admit any doctrine of verbal inspiration. They now generally hold the simple humanity of Christ, and even reject his supernatural birth, thinking the part of the gospels which records that event less authentic than the parts referring to the life, teaching, death, and resurrection of Jesus. To the death of Christ they ascribe much the same kind of efficacy as was ascribed to it by the Socinians, regarding his teaching and example as the essential part of his work, and his death as an attestation to the truth of his mission. Many of them do not hold to his bodily resurrection. What, however, chiefly distinguishes the conservative from the new or progressive Unitarians is the place which—following Locke's philosophy and Priestley's theology—they give to the miracles as supernatural sanctions indispensable for evidencing to man the truth of Christianity. 'If there be any truth in history,' says Dr. Priestley, whose influence can still be traced in the conservative Unitarians, 'Christ wrought unquestionable miracles, as a proof of his mission from God; he preached the great doctrine of the resurrection from the dead; he raised several persons from a state of death; and, what was more, he himself died and rose again in confirmation of his doctrine. The belief of these facts I call the belief of Christianity.' The new or progressive Unitarians, on the other hand, regard man as having within his own nature the germs of the highest religious faith. Christianity, accordingly, they regard not as a *message* or a system of truth communicated and authenticated from without, but as the highest expression of the divine in humanity—an expression not necessarily preternatural, but having its place in the history of mankind by the natural laws of moral and spiritual development. To this view of Christianity the miracles are not essential as proofs; and Christian truths are thought to be unaffected by any judgment regarding them. However, many of the Unitarians of this school accept the miracles as historical facts, considering that there is sufficient evidence for them. An increasing number agree with many of the German critics in rejecting them, on the twofold ground that they are intrinsically incredible and that the evidence for them is conflicting and uncertain. Generally, the Unitarians of this school are disposed to the very freest criticism of the Bible—holding that inspiration is not peculiar to the Bible, but common to all the most elevated religious literature, and gives no immunity from error. Yet, as a record of the grandest religious movements of the world's history, they hold the Bible in the highest estimation. From these distinctive views, these two Unitarian schools in fact merge into each other by imperceptible gradations, with evident and steadily increasing gain of the new or rationalistic mode.

The Unitarians of all shades of opinion are agreed in rejecting the entire orthodox scheme—including the doctrines of the Trinity, the vicarious atonement, the consubstantiality of Christ with the Father, original sin, and everlasting punishment—as both unscriptural and irrational. They generally celebrate the Lord's Supper in their churches

as merely a service commemorative of Christ's death as a martyr, and expressive of spiritual communion with him. They also adhere generally to the rite of infant baptism. In recent years the Unitarians have given great prominence to the principles of Comprehension and of Free Inquiry apart from the restraints of theological creeds, conceiving that in this they are conforming to the spirit of their English Presbyterian forefathers; and many object even to the name Unitarian, as one which might imply a doctrinal bond of union, and might thus be inconsistent with the fundamental principles of the body. Illustrative of this point has been the action of the Unitarians in England and the United States in giving an emphatic negative to motions defining 'Unitarian Christianity'—the motions being intended as a conservative protest against anti supernaturalism. The rejection, on the other hand, was an assertion of the principle of comprehension and freedom, and in each case was voted for by many who sympathized doctrinally with the proposer, as well as by those who differed from him.—Dr. Beard's *Unitarianism in Its Actual Condition;* the Rev. J. J. Tayler's *Religious Life of England;* Otto Fock's *Socinianismus;* Lange's *Geschichte und Lehrbegriff der Unitarier vor der Nicänischen Synode;* J. H. Allen's *Our Liberal Movement in Theology* (2d ed. Boston 1883); and theological writings of J. Martineau.

UNI'TAS FRA'TRUM: see MORAVIAN BRETHREN.

UNITE, v. *ū-nīt'* [L. *unītus*, pp. of *unĭō*, I join together —from *ūnus*, one: It. *unire*: F. *unir*]: to join two or more into one; to combine; to join in affection or interest; to cause to agree; to make to adhere; to coalesce; to be cemented; to couple; to grow together; to be mixed; to concur; to act in concert; to grow up into one. UNI'TING, imp. UNI'TED, pp.: ADJ. joined; made to agree; mixed. UNI'TEDLY, ad. *-lĭ*. UNITABLE, a. *-tā-bl*, that may be united. UNI'TER, n. *tĕr*, one who or that which unites. UNITIVE, a. *ū'nĭ-tĭv*, tending toward union. UNITY, n. *ū'nĭ-tĭ* [L. *unĭtas* or *unĭtātem*, oneness]: state of being one; concord; agreement; oneness of sentiment or behavior. UNITIES, n. plu. *ū'nĭ-tĭz*, the correspondence of various parts so as to form one harmonious whole; the principles of dramatic writing, in which the correspondence of time, place, and action is preserved. UNITED BRETHREN, the Moravians (q.v.). UNITED PRESBYTERIANS, in *Scot.*, the church formed in 1847 by the amalgamation of the Secession and Relief churches.—SYN. of 'unite': to coalesce; connect; add; join; amalgamate; attach; cohere;—of 'unity': union; oneness; junction; harmony.

UNI'TED ARMENIANS, *âr-mē'nĭ-anz*, or ARME'NIAN U'NIATS: members of an Armenian Cath. chh. organization in communion with the Roman see. Their liturgy differs in essence and in language from that of Rome; as does also their ecclesiastical discipline. Their proximate head is the patriarch of Cilicia, residing at Constantinople. The people number about 100,000, and live in Turkey, Russia, both Armenias, Syria, Mesopotamia, and Egypt. There are 10 bps. and abps., and about 350 priests: see UNIATS: ARMENIAN CHURCH: GREEK CHURCH—*United Greeks.*

UNI'TED BRETH'REN, or BOHEMIAN BRETHREN: see MORAVIAN BRETHREN.

UNI'TED BRETH'REN IN CHRIST: denomination of evangelical Christians founded through the labors of the Rev. Philip William Otterbein (q.v.). Though not formally organized till 1800, its origin is traceable to the revival movement begun by the meeting of Mr. Otterbein with the Rev. Martin Boehm, a minister of the Mennonites, about 1766. Following this date, 'great meetings' were held, and revivals were promoted, especially among the Germans. As the work enlarged, preachers were licensed by these leaders, and conferences were held 1789 and 91; but the movement did not take the form of a church till 1800, when a conference was held at Peter Kemp's in Frederick co., Md., at which the name of the denomination was definitely fixed, and Otterbein and Boehm were chosen bishops. Thereafter conferences were held annually. At the first general conference, 1815, June, at Mt. Pleasant, Penn., the Confession of Faith was revised and formally adopted. The church was not the result of a schism, nor an offshoot from any denomination, but the result of a natural growth in adoption of such organization and methods as were found requisite in its providential mission. The U. B. have sometimes been confounded with the Moravians, *Unitas Fratrum*, with whom they never had any historical connection. They have been classed sometimes as Methodists, for which there is no authority whatever: Otterbein and Boehm both were preaching the doctrines of a change of heart and the witness of the Spirit before there were any Methodists in America. The government of the church is composite, combining elements of simplicity and flexibility. A formal constitution for the church was adopted by the general conference 1841. The highest legislative and judicial authority is vested in a general conference which meets quadrennially, composed of elders and laymen elected by the entire membership of the church. Other official bodies in the church are annual and quarterly conferences, and on stations the official board. Lay representation in the annual conferences was authorized 1877, and was made a definite rule 1889. The superintendents of the church are called bishops, and are elected every four years by the general conference. In the annual conferences superintendents are known as presiding elders, and are chosen for a period of one year. The constitution provides for the 'itinerant

plan' of ministerial service. Ministers are appointed to their charges one year at a time by a stationing committee composed, since 1889, of the bishop and presiding elders of an annual conference. The time-limit of the pastoral term is fixed at three years, with the provision that it may be indefinitely extended by consent of the annual conference Since 1889, women have been admitted to the ministry on the same terms as men. The general conference of 1885 provided for a commission of 27 members, lay and clerical, to submit to the membership amendments to the constitution and a revised Confession of Faith. The results were approved by a very large vote at a general election throughout the church 1888, Nov. At the following general conference, 1889, May, in York, Penn., the amended constitution and the revised Confession of Faith were declared to be the organic law and articles of faith. A schism resulted from this progressive action, 15 members withdrawing from the general conference, who formed a separate organization, with a small and scattered following.

The church is Arminian in theology, is characterized by liberty and simplicity in worship, congregational singing, and participation of all members, male and female, in the devotional services. It is aggressive and evangelistic in spirit; and on moral questions has ever taken advanced ground, especially on slavery and intemperance. The observance of baptism and the Lord's Supper is required; but the mode of baptism and the manner of observing the Lord's Supper are left to individual judgment. A personal religious experience is a condition of membership.

Originating in Md., Penn., and Va., the church extended westward, first to Ohio and Ind., then to Canada and the western states and territories to the Pacific coast. Though its first work was principally among the Germans, at present less than 2 per cent. are attending services conducted in the German language. A publishing-house was established at Circleville, O., 1834; removed to Dayton, O., 1853. The *Religious Telescope*, the leading organ of the church, was founded 1834; *Our Bible Teacher*, magazine for S.-S. teachers, 1873; the *Quarterly Review*, 1889. The net assets of the publishing house are $280,268.03, with annual business of more than $160,000, that yields large profits, which are devoted to the support of old and dependent ministers, and of the widows and orphans of ministers deceased. In 1853 a Missionary Soc. was organized, having home missions, and missions in Germany, w. Africa, and Japan. In 1875 the Women's Missionary Assoc. was organized, and now has successful missions in Germany, Africa, and China, and among the Chinese at Portland, Ore. The church has a theol. seminary at Dayton, O. (the Union Biblical Seminary, total assets $178,-753, course of study 3 years); 9 colleges—the first being established 1847; 6 academies; with buildings and ground worth $400,000, and endowments aggregating $395,000. Its leading educational institution w. of the Mississippi is Western College, founded 1856, established at Toledo,

Iowa, 1881; pres., the Rev. L. Bookwalter, D.D. Co-education of the sexes has been a satisfactory feature throughout. The curriculum provides two years of preparatory study and four years of regular college work. There is a Conservatory of Music and a College of Commerce. The building (rebuilt 1890, after a fire) is one of the most complete college buildings in the state; total assets $190,877; students (1895) 275. The church has also church erection, Sunday-school, and educational boards, and is incorporated by a board of trustees elected 1889. The following are statistics for 1895: Churches 2,242; ministers 2,104; members 233,204, a gain of about 5 per cent. over 1894 and of nearly 15 per cent. since 1890; Young People's Christian Union societies 1,419; members 56,405; Sunday schools 3,573; officers, teachers, and scholars 281,428; contributions for missions, general $46,051; woman's $15,162; for educational purposes $50,085; total for all purposes $1,186,-923. In 1902 there were 1,912 ministers, 3,965 churches and 246,250 members.

UNITED COLONIES OF NEW ENGLAND (1643): see CONFEDERATION OF THE THIRTEEN AMERICAN COLONIES.

UNITED EVANGELICAL CHURCH: the official or state Protestant chh. of the kingdom of Prussia. The division of Protestants into Lutherans and Calvinists was deeply regretted by statesmen and churchmen throughout Germany from the beginning, and many attempts were made to effect a union through the instrumentality of conferences such as that at Leipzig 1631, at Thorn 1645, at Cassel 1661. But at last an autocratic decree brought about the long-desired consummation in Nassau and Prussia 1817, Hesse 1823, Anhalt-Dessau 1827. The process of unification was attended with some friction; but the governments were not over-exacting, and soon the Lutherans and Reformed worshipped together in harmony. People were not required to forsake their Lutheranism or their Calvinism (see LUTHERANS): the two bodies, Lutheran and Reformed, were simply brought under one government —that of the Oberkirchenrath or superior church council. The result as seen in the Prussian census returns of 1875 is that nearly the whole body of Protestants in that kingdom belong to the U. E. C.: of 16,636,990 Protestants, 13,266,-620 were in the state church fold; the rest were in Lutheran and in Reformed churches. In later censuses of Prussia, Protestants, whether of the U. E. C., the Lutheran, or of the Reformed churches, are classed together as simply 'Evangelical;' but the established chh. still holds the great mass of the Prot. believers. The number of ununited Calvinists and Lutherans is as large as it is only on account of the unwillingness of Protestants in recently conquered provinces, as Hanover and Sleswick-Holstein, to enter the Prussian state chh.

UNITED FREE CHURCH OF SCOTLAND: see FREE CHURCH OF SCOTLAND.

UNITED GREEKS: see GREEK CHURCH.

UNITED KINGDOM OF GREAT BRITAIN AND IRELAND: the legal and official designation of the British Islands, since the union of the three kingdoms of England, Scotland, and Ireland, 1801. See GREAT BRITAIN: UNION, LEGISLATIVE, of Great Britain and Ireland: ETC.

UNITED METHODIST FREE CHURCH: see METHODISTS (British).

UNITED PRESBYTERIAN CHURCH: religious body in Scotland, constituted 1847 by amalgamation of the SECESSION and RELIEF CHURCHES.

The SECESSION CHURCH.—The Prot. Reformation in Scotland was very emphatic and decisive in regard to both the doctrine and the government of the church. The people became strongly Calvinistic and Presbyterian; and the efforts of King James to supplant their system by Episcopacy proved unavailing, so far as the great body of the commons and gentry were concerned; though, from various considerations, many of the Scottish nobles adopted the church principles of their sovereign, and after the Restoration (1660) supported the governments of Charles and James in their persecution of the Covenanters: see COVENANTS: SCOTLAND: SCOTLAND, CHURCH OF. At the meeting of the Scottish Estates 1690, Episcopacy, which in Scotland had obtained temporary supremacy under the rule of Sharp (q.v.) and Lauderdale, was abolished, and Presbyterianism (q.v.) re-established. But after the 'glorious revolution' the spirit of the nation underwent a great change in regard to religion; and the new latitudinarianism of the times appears in the fact that hundreds of Episcopalian curates were allowed to retain the parishes in which they had been arbitrarily stationed, on subscribing the Confession of Faith; and great numbers of Episcopalian laymen became elders in a church whose strict adherents they had themselves recently hunted even to death. Bp. Burnet describes these curates as 'the worst preachers I ever heard, ignorant to a reproach, and many of them openly vicious.' In 1712, when the obnoxious *Law of Patronage* was restored, the triumph of the 'court' or 'Moderate' party in the church was complete: see MARROW CONTROVERSY. Violent settlements of curates, effected by the agency of dragoons, became frequent; and the petitions and appeals of the people against them were disregarded by the gen. assembly, and in 1730 were even rebuked. The Rev. Ebenezer Erskine (1732) publicly denounced this ecclesiastical tyranny; and he, with 3 other ministers, having refused to retract after admonition and censure—first by his synod, and then on appeal to the gen. assembly—were (1733) declared 'no longer ministers of the church.' Thereupon they protested that they were obliged to 'make a secession.' (See ERSKINE, EBENEZER.) This was the origin of the famous Secession Church, which has made so deep an impress on the religious life of Scotland. Erskine and his friends published a statement of their reasons for separation, under the title *A Testimony to the Doctrine, Worship, Government, and Discipline of the Church of Scotland, or Reasons (by the Four Brethren) for*

Their Protestation entered before the Commission of the General Assembly. This document, afterward known as the 'First or Extrajudicial Testimony,' shows that it was not only the odious 'law of patronage' that induced Erskine and his friends to leave the church of their fathers; but an accumulation of grievances that in their eyes had become insupportable. What the 'four brethren' sought was the vindication of what they held to be evangelical truth. So much popular indignation was excited by the deposition of the 'four brethren,' that the 'Moderate party' thought it best to make some concessions to the 'Evangelicals' or 'Marrow party.' Accordingly, the gen. assembly 1734 empowered the 'synod of Perth and Stirling' to remove the censures from the four brethren; but Mr. Erskine declined to be 'reponed;' and published his reasons. In 1736, Dec., appeared the pamphlet entitled *An Act, Declaration, and Testimony for the Doctrine, Worship, Discipline, and Government of the Church of Scotland,* commonly known as the 'Judicial Testimony,' which is a sort of survey of the whole ecclesiastical history of Scotland from the Reformation. In 1737 four other ministers joined the original 'four.' The church authorities now resolved to proceed to extremities against the seceders; and after one final effort to win them back, the gen. assembly of 1740 solemnly pronounced their deposition. In spite of the frequent refusal of sites for churches, and other modes of persecution, the Secession Church prospered.

In 1747 a rupture or 'breach' took place in the new body on the question of the burgess-oath, some affirming that this oath could not be taken by any consistent Seceder, and others insisting that it could, and that the question regarding it ought to be a matter of mutual forbearance. The party condemning the religious clause in the burgess-oath formed the *General Associate Synod,* or, popularly, the *Anti-burgher Synod;* the party tolerating it, the *Associate* or *Burgher Synod.* Subsequently a second split occurred in each of these; and two other minor denominations were formed—one assuming the designation of the *Constitutional Associate Presbytery,* or *Old Light Anti-burghers* (1806); and the other the designation of the *Original Burgher Presbytery,* or *Old Light Burghers* (1799). After holding aloof more than 70 years, the Burghers and Anti-burghers were solemnly reunited. At the date of the 'breach' (1747) the number of Secession congregations was 32; when the reunion took place (1820) it had increased to 262. Thereafter the Secession Church had uninterrupted prosperity. A certain change, however, began to show itself in the character and spirit of the denomination. Their *old-world look,* their interest chiefly in bygone events, their very language —like their sentiments—archaic, took on a modern aspect: they felt the new-born enthusiasm for foreign missions; and in 1847, at the union of the Secession and Relief Churches, the former was supporting a staff of more than 60 missionaries in different parts of the world. Further the *Secession* Church began to assume an attitude more antagonistic to the Establishment; and a controversy be-

tween leading divines of the Establishment and of the Secession, known as the *Voluntary Controversy* (1829-34), served to strengthen the voluntaryism of the Seceders (see VOLUNTARYISM), and brought them nearer to the Relief Church (see below). Next followed the *Atonement Controversy*, in which the Secession Church adhered to the liberal evangelical theology of the Marrow; in this also having sympathy of the Relief body. In 1847, May 13, the two churches formed themselves into one body, the UNITED PRESBYTERIAN CHURCH.

We now revert to the RELIEF CHURCH. After the expulsion of Erskine and his friends from the Church of Scotland, the assemblies (packed with 'court of session elders') became more determinedly 'Moderate' than ever. They proceeded to deprive the people of all right to elect, or in any way to interfere with the election of, ministers. Never were forced settlements more shameless than about this period: and the demand for *Relief* took the form of a protest against the induction of a very unpopular minister to the parish of Inverkeithing, presbytery of Dunfermline (1749). This protest, after much discussion, in presbytery and gen. assembly, resulted 1752 in the condemnation and deposition by the assembly of the Rev. Thos. Gillespie, for his leadership in a steadfast refusal to obey the order of the assembly to proceed with the unpopular induction—the order being addressed to the presbytery of Dunfermline. Thus the *Relief Church* was founded on an assertion of the right of congregations to elect their own ministers. 'Societies' (as in the case of the Seceders) sprang up in many places, and were gradually formed into congregations; though the Relief had long to sustain a severe attack from the Seceders and the Reformed Presbyterians, for their adherence to the latitudinarian principle of 'free communion,' i.e., of holding Christian fellowship at the Lord's table with other denominations. At the union 1847 the Relief numbered 113 congregations, while the Secession numbered 384 congregations; so that the UNITED PRESBYTERIAN CHURCH began with 497 churches and a membership estimated at more than 140,000.

UNITED PRESBYTERIAN CHURCH.—The career of this church as a corporate body has been prosperous. In doctrine it adheres (like all the other Presb. churches of Scotland) to the Westminster Confession of Faith and the Larger and Shorter Catechisms, 'it being always understood that we do not approve of anything in these documents which teaches, or may be supposed to teach, compulsory or persecuting and intolerant principles in religion'—a qualification supposed to refer particularly to the 23d chapter of the Confession of Faith. Its form of church government is Presbyterian; but, unlike the Established and Free Churches, it has no intermediate courts (synods) between presbyteries and the supreme court, the latter of which it designates not as a Gen. Assembly, but only as a Synod; though, in fact, it partakes more of the nature of a 'general' assembly than the bodies known by

that name, since it is really an assembly of the whole clergy of the denomination, with one elder from each kirk-session. (See SCOTLAND, CHURCH OF: FREE CHURCH OF SCOTLAND: PRESBYTERIANISM.) It has a Theological Hall and Library in Edinburgh, and a staff of professors. The U. P. Church is now, both in practice and in theory, a voluntary church, having by long experience of practical voluntaryism reached the conviction that Christianity is best served by total separation of church and state. Although with less wealth than the Established and Free Churches, the U. P. Church has not been inferior in its general liberality.

In 1875 about 100 congregations of the U. P. Church formed in England were transferred by the mother church in Scotland to the 'Presbyterian Church in England' (q.v.). Since the separation of its English branch the U. P. Church still counts about 550 congregations and 175 000 members. Protracted negotiations for union between the U. P. and Free Churches have been without result.

UNITED PRESBYTERIAN CHURCH OF NORTH AMERICA: denomination formed by the organic union of two previously distinct Presb. bodies, the 'Associate Presbyterian Church' and the 'Associate Reformed Presbyterian Church.'

The *Associate Reformed Chh.* in the United States represented a union of Irish and Scotch Presbyterians belonging to the Secession Chh. of Scotland and to the Chh. of the Covenanters or Reformed Presbyterians respectively: the people were settled mostly in Va., Penn., and N. J. The union was consummated at a meeting of presbyters of the two churches named, and of some Burgher presbyters (another small branch of Scotch Presbyterianism), at Philadelphia, 1782, Oct. There was formed a synod, styled Associate Reformed Synod of North America. From its chief stronghold in the Cumberland valley of Penn., the Associate Reformed Chh. sent colonies to the Carolinas, Ga., Ky., and to N. Y., Me., and N. H. When this chh. coalesced with the Associate Presbyterian Chh. 1858, to form the United Presbyterian Chh., it had 4 synods, 28 presbyteries, 253 ministers, 31,284 communicants.

The *Associate Presbyterian Chh.* came into existence 1782, as a protest against the 'Declaration and Testimony' of the Associate Reformed. It early had a valuable accession of strength in ministers sent out from Scotland; to it also, after a while, gravitated many sternly orthodox Presbyterians, ministerial and lay, from the Associate Reformed fold. Its first synod (1801) consisted of 17 ministers, divided into 4 presbyteries. There was a serious division, even an organized secession, of the more strict venerators of Scotch orthodoxy 1840; but the erring brethren were taken back into the fold 1854. At the formation of the United Presbyterian Chh. 1858, the Associate Synod comprised 21 presbyteries, 231 ministers and licentiates, 23,505 communicants: thus had the insignifi-

cant band of seceders from the Associate Reformed Chh., 1782, grown to almost as large proportions as its rival.

The union forming the U. P. Church was effected 1858, May, on the doctrinal basis of the Westminster Confession of Faith (with a very slight modification) and the Westminster Catechisms, and on a 'Testimony' comprising 18 articles relating to conduct, terms of communion, etc. Among the points of the testimony was the denunciation of slave-holding (long before condemned in the uniting churches) as sinful; condemnation of secret oath-bound societies; restriction of the song-service to the use of the Bible psalms; denial of communion in saving ordinances to persons who refuse to adhere to the church's profession of faith. In 1868 the gen. assembly gave an interpretation on 'communion in saving ordinances,' leaving the matter to the discretion of sessions. A report published at the first general assembly, held in Xenia, O., 1859, May, showed 55,547 members, in 634 congregations, served by 408 ministers, in 42 presbyteries. The same general assembly constituted the following boards for conducting the operations of the chh.: foreign missions, home missions, publication, church extension, education. Later, to these were added boards of freedmen's missions and of ministerial relief. An improved metrical version of the psalms was approved by the general assembly for use in public worship 1871. The assembly also declared the church prohibition of instrumental music in worship repealed: instruments are being introduced into many of the leading churches.

The official statistics for 1896 are: Synods 12; presbyteries 65; ministers 869; average salary of ministers $1,054; ministers without charge 280; congregations 948; congregations without pastors 252; members 120,790—increase over 1895, 3,093, or about 2½ per cent., and an increase of 20 per cent. since 1890; Sabbath schools 1,122; officers and teachers 11,589; scholars 107,121; congregational missionary societies 921; young people's societies 805, with members 35,146; contributions for salaries and congregational purposes $1,059,996; to boards $255,366; for general purposes $102,736; total $1,404,090, averaging $13.13 per member; theological seminaries at Allegheny, Penn., and Xenia, O., with 143 students, and productive endowments of $291,800; 9 colleges and academies, with 1,142 students, and productive endowment of $352,000; publishing house at Pittsburg, Penn.; leading church paper, the *United Presbyterian;* foreign mission fields in Egypt and India. In 1902 there were 914 churches, 117,232 communicants.

The principal strength of the denomination is found in the following states: Penn. has 42 per cent. of the total membership, confined mostly to the western part of the state; O., 16 per cent.; N. Y., 10 per cent.; Iowa, 8 per cent.; Ill., 7 per cent.; and Kan., 4 per cent.—See UNITED PRESBYTERIAN CHURCH (in Scotland): SCOTLAND, CHURCH OF: PRESBYTERIANISM: ETC.

UNITED PROVINCES: see NETHERLANDS.

UNITED STATES ARMY (popularly known as 'the regular army'): national militia established by act of congress, under the official control of the pres. as commander-in-chief of the army and navy, directed by the sec. of war under orders from the pres., and a general staff corps, consisting of 1 chief of staff, 2 general officers, and a number of other officers of subordinate rank. The enlisted strength of the army 1903 was as follows: cavalry, 12,240; coast artillery, 13,734; field, 3,680; non-commissioned staff and bands, 328; infantry, 24,480; engineer battalions and bands, 1,282; additional strength for troops stationed at the general service and staff college, school of application and legation guard, Pekin, 770; enlisted men, staff departments, etc., 2,783; total, 66,497. There is 1 division: the Philippines, and there are 11 departments: Luzon, Visayas, Mindanao, California, Colorado, the Columbia, Dakota, the East, the Lakes, Mo. and Tex. A war college for instruction of officers is situated at Washington. In 1902, commissioned officers in the active list were 3,820, the total enlisted strength 77,287, exclusive of the provincial force and the hospital corps. Privates in the artil., cav., and inf., and the engineers (2d class), ordnance, and signal corps, are paid $13 per month in the 1st and 2d year of a first enlistment, $14 in the 3d year, $15 in the 4th, and $16 in the 5th; $18 per month in each of the 5 years of a first re-enlistment; and $19 per month in each year of subsequent enlistments. Privates in the engineers (1st class), ordnance, and signal corps, receive $17 per month in the 1st and 2d year of a first enlistment, $18 in the 3d year, $19 in the 4th, and $20 in the fifth; $22 per month in each of the 5 years of a first re-enlistment; and $23 per month in each year of subsequent enlistments. See STOPPAGE OF PAY.

See ENGINEERS, UNITED STATES CORPS OF: ORDNANCE DEPARTMENT—in the United States: QUARTERMASTER'S DEPARTMENT: also, under GENERAL: LIEUTENANT: ETC.

There are 11 milit. bureaus in the war dept., the chiefs of which are officers of the regular army, and a part of the permanent establishment—viz., adjudant-general, inspector-general, quartermaster-general, commissary-general, surgeon-general, paymaster-general, chief of engineers, chief of ordance, judge-advocate-general, chief signal officer, chief record and pension officer. All chiefs have the rank and pay of a brigadier-general.

Service in the U. S. A. is purely voluntary. The army is officered above the grade of sergt. by graduates of the U. S. Military Academy (q.v.), excepting where specially meritorious service leads to the promotion beyond that grade of subordinate officers and privates.

The only milit. reserve force in the U. S. is the militia of the several states and territories, which, though not constantly under arms, is always available for local or general emergencies. In 1903 this force aggregated 8,921 commissioned officers, and 109,338 enlisted men; total liable to military duty, 10,853,396. See MILITIA: U. S. N.

The U. S. maintained at Washington, D. C., a home

TABLE OF PAY ALLOWED BY LAW TO OFFICERS OF THE U. S. ARMY.

Grade.	Pay of Officers in active Service.*						Pay of Retired Officers.*					
	Pay of Grade.		Monthly Pay.				Pay of Grade.		Monthly Pay.			
	Yearly.	Monthly.	After 5 Years' Service	After 10 Years Service	After 15 Years' Service	After 20 Years' Service	Yearly.	Monthly.	After 5 Years' Service	After 10 Years' Service	After 15 Years' Service	After 20 Years' Service
			10 *p. ct.*	20 *p. ct.*	30 *p. ct.*	10 *p. ct.*						
Major-General	$7,500.00	$625.00	.....	.....	.....	.....	$5,625.00	$468.75	.....	.....	.....	.....
Brigadier-General	5,500.00	458.33	.....	.....	.....	.....	4,125.00	343.75	.....	.....	.....	.....
Colonel	3,500.00	291.67	$320.00	$350.00	†$375.00	$375.00	2,625.00	218.75	$240.62	$262.50	$281.25	$281.25
Lieutenant-Colonel	3,000.00	250.00	275.00	300.00	325.00	‡333.33	2,250.00	187.50	206.25	225.00	243.75	250.00
Major	2,500.00	208.33	229.17	250.00	270.00	291.67	1,875.00	156.25	171.87	187.50	203.12	218.75
Captain, mounted	2,000.00	166.67	183.33	200.00	216.67	233.33	1,500.00	125.00	137.50	150.00	162.50	175.00
Captain, not mounted	1,800.00	150.00	165.00	180.00	195.00	210.00	1,350.00	112.50	123.75	135.00	146.25	157.50
Regimental Adjutant (Captains mounted)	2,000.00	166.67	183.33	200.00	216.67	233.33	.....	.....	.....	.....	.....	.....
Regimental Quartermaster (Cantains mounted)	2,000.00	166.67	183.33	200.00	216.67	233.33	.....	.....	.....	.....	.....	.....
Regimental Commissary (Captains mounted)	2,000.00	166.67	183.33	200.00	216.67	233.33	.....	.....	.....	.....	.....	.....
Battalion and Squadron Adjutant, Eng., Cav., and Infry.	1,800.00	150.00	165.00	180.00	195.00	210.00	.....	.....	.....	.....	.....	.....
Battalion and Squadron Quartermaster and Commissary	1,600.00	133.33	146.67	160.00	173.33	186.67	.....	.....	.....	.....	.....	.....
First Lieutenant, mounted	1,600.00	133.33	146.67	160.00	173.33	186.67	1,200.00	100.00	110.00	120.00	130.00	140.00
First Lieutenant, not mtd.	1,500.00	125.00	137.50	137.50	162.50	175.00	1,125.00	93.75	103.12	112.50	121.87	131.25
Second Lieutenant, mounted	1,500.00	125.00	137.50	137.50	162.50	175.00	1,125.00	93.75	103.12	112.50	121.87	131.25
Second Lieutenant, not mtd.	1,400.00	116.67	128.33	128.33	151.67	163.33	1,050.00	87.60	96.25	105.00	113.75	122.50
Chaplain	1,800.00	150.00	165.00	165.00	195.00	210.00	1,350.00	112.50	123.75	135.00	146.25	157.50

* For law establishing the present rates of pay, see sections 1261, 1262, 1263 and 1274, Revised Statutes, and Acts March 2, 1899, and Feb. 2, 1901.
† The maximum pay of a Colonel is by law $4,500 per annum. ‡ The maximum pay of a Lieutenant-Colonel is by law $4,000 per annum.

for discharged soldiers of the regular army and a national home for disabled soldiers and sailors of the volunteer (civil war) army, with branches at Dayton, O.; Milwaukee, Wis.: Togus, Me.; Hampton, Va.; Leavenworth, Kan.; Santa Monica, Cal.; and Marion, Ind. The following states also maintained homes for disabled soldiers and sailors of the Union volunteer army: Cal., Col., Conn., Ida., Ill., Io., Kan., Mass., Mich., Minn., Neb., N. H., N. J., N. Y., N. D., O., Ore., Penn., R. I., S. D., Vt., Wash., and Wis. Homes for disabled Confederate soldiers and sailors were in operation in many Southern states.

UNITED STATES MILITARY ACADEMY: national institution at West Point, N. Y., for education of officers for the regular army; organized 1802. Candidates for admission must be 17–22 years old, at least 5 ft. in height, of good moral character, and free from anything that would render them unfit for milit. service. They must pass a severe medical examination, and an examination in reading, writing, orthography, arithmetic, elements of Eng. grammar, descriptive geography, and the history of the United States. The course is 4 years, the pay is $540 per annum; an oath of allegiance is required of each cadet, also a pledge to serve the United States for 8 years after graduation unless sooner discharged. Admission is secured by appointment—each congressional district and terr. and the D. C. being entitled to one cadet, and the pres. of the United States having the right to appoint 10 cadets annually from the country at large. Appointments from states and territories are made by the sec. of war on recommendation of congressional representatives and delegates; and presidential appointments are usually of sons of dead or distinguished officers of the army or navy or of other officials. In recent years the practice has become general for a representative or delegate to recommend to the sec. of war for appointment the boy who attains the highest ratings in a competitive examination held for the purpose and open to all eligible boys in the district.—The curriculum comprises the departments of tactics; civil and military engineering; natural and experimental philosophy; mathematics, history, geography, and ethics; chemistry, mineralogy, and geology; drawing; modern languages; law; practical military engineering, military signalling, and telegraphy; and ordnance and gunnery. The professors in the various depts. are usually appointed from civil life, and receive the pay of lieut.col. in the army in the first 10 years of service, and that of col. afterward; and the asst. professors and instructors are young officers appointed from the army, who receive the army pay of their respective grades. The chief executive is officially known as the supt., and while holding the office has the rank and pay of a col. of engineers, whatever his army grade may be. As the acad. was originally established as a school of engineering, its supts. for many years were appointed from the corps of engineers; but since 1866 the office of supt. has been open to all branches of the service. The second executive

officer is the commandant of cadets, who has the rank and pay of a lieut.col. of engineers. The annual examinations are held in the presence of a 'board of visitors,' comprising 7 members appointed by the pres., 2 U. S. senators appointed by the pres. of the senate, and 3 representatives appointed by the speaker of the house. The graduating class is divided into 3 parts when practicable, the first comprising those of exceptionally high standing, who are privileged to select the branch in which they wish to serve; the second, those recommended for commissions in any branch excepting the engineers; the third, those recommended for any branch excepting the engineers and artillery. The graduates are commissioned brevet 2d lieuts. and 2d lieuts. by the pres. according to the recommendations of the board of visitors. In the academic year 1895–6 the acad. had 9 permanent professors; 55 officers of the army temporarily detailed as instructors and for other duties connected with the acad. and milit. post of West Point; 322 cadets; 38,203 vols. in the library; in 1900 there were 74 officers and 420 cadets. A number of new buildings, including Cullum Memorial Hall, have been erected since 1899, at a cost of $6,000,000. The milit. reservation covers about 2,400 acres. Neither the total value of the grounds and buildings nor of the scientific apparatus, with which each dept. has been liberally supplied, has ever been estimated. Under the 1880 census the number of cadets authorized by law was 347; under that of 1890 the number was increased to 371; under that of 1900 to 481. Owing to resignations, discharges, and other causes, the number present for duty is generally about 18 per cent. below the maximum.

UNITED STATES NAVAL ACADEMY: national institution for education of officers for the U. S. navy; at Annapolis, Md., established by George Bancroft, when sec. of the navy, and opened 1845, Oct. 10. The site and buildings of Fort Severn, on Annapolis harbor, at the mouth of the Severn river, were transferred by the war dept. to the 'Naval School,' as it was originally called. Prior to the establishment of the institution, midshipmen were instructed aboard ship by the chaplain, or, when they could be spared from ship-duty, by schoolmasters ashore; and promotions were made on satisfactory examinations at the U. S. Naval Asylum in Philadelphia The original purpose of the school was to gather the midshipmen on shore-duty or leave of absence, and give them special instruction in those practical studies with which neither naval chaplains nor land school-masters were expected to be familiar. In 1849 a board of officers was convened to reorganize the school and make it for the navy what the U. S. Milit. Acad. was for the army. As results, the name of the institution was changed to the present form, the course of study was fixed at 4 years, a war-vessel was assigned to the institution to increase the practical character of the curriculum and to afford means of an annual summer cruise, and the entire course of instruction was

revised and enlarged. Gradually congress has increased the depts. of study; provided models, museums, workshops, mechanical apparatus and tools, philosophical, chemical, and astronomical appliances, and a great variety of practical aids; and lengthened the duration of the course of study to 6 years, as at present, of which 2 are spent at sea. Candidates for admission must be 14–18 years old; at least 5 ft. in height; of good moral character and sound physical condition; must undergo a physical examination, and an examination in algebra, arithmetic, English grammar, geography, U. S. history, reading, writing, and spelling; must take the oath of allegiance to the federal govt.; and must agree to serve the govt. for 8 years unless sooner discharged. Successful candidates receive appointments as naval cadets; are obliged to provide themselves with various articles of attire, and classroom, mess, and dormitory appurtenances, now aggregating in cost $200; have $60 per annum retained from their annual pay to meet the cost of their graduation outfit; and are allowed $500 per annum from the time of their appointment till their graduation, but have only a nominal control over the money. After leaving the acad., and while at sea in other than practice-ships, their pay is $950 per annum. Appointments to the Naval Acad. are made in the same manner and to the same number as to the U. S. Milit. Acad. (q.v.). In the academical year 1895–6 the curriculum comprised the departments of seamanship, naval instruction, and naval tactics; ordnance and gunnery; astronomy, navigation, and surveying; steam-engineering; mechanics and applied mathematics; physics and chemistry; mathematics; English studies, history, and law; modern languages; mechanical drawing; physiology and hygiene; and boxing, fencing, swimming, and gymnastics. By act of congress, 1889 the academic board annually separates the 1st class of cadets, then entering their 4th year, into two divisions, as they may have shown special aptitude for the duties of the respective corps; and thereafter these cadets pursue a course of study specially prepared to fit them for service in the line of the navy, the marine corps, and the engineer corps. Chief executive officers (1896) were a supt., with lineal rank of capt., and 2 assistants; a commandant of cadets, with rank of commander, and 6 assistants; and a commandant of marines. Nearly all the professors and instructors were regular officers of the navy on 4-year details. There were 65 professors and instructors; 247 cadets; 35,235 vols. in the library; grounds, buildings, and scientific apparatus valued at $965,250; in 1902 there were 69 instructors and 390 cadets.

UNITED STATES NAVY: national marine force, reorganized by act of congress 1798, under the official control of the pres. as commander-in-chief of the army and navy, and under the immediate orders of the sec. of the navy; also comprising the U. S. marine corps (see MARINES). For administrative purposes the executive dept. of the navy was divided 1902 into 8 bureaus—yards and docks, equipment, navigation, ordnance, construction and repair, naval intelligence, supplies and accounts, medicine and surgery—and had a law office under a judge-advocate-general. Each bureau was under the direction of an officer bearing the title of chief and having the relative rank of commodore, whatever his lineal rank might be, while holding the office, and the judge-advocate-general ranked as captain while holding his office. Besides regular duty, many officers were employed as members of the light-house board, as light-house inspectors, on the board of inspection and survey, on duty in connection with the inspection of steel and armor for new vessels, on the coast and geodetic survey, on the commission of fish and fisheries, on nautical school ships, at the naval acad., and as instructors in various colleges. In addition to commanding, staff, and line officers, there were officers of the medical, pay, and engineer corps, naval constructors (who have become exceedingly important since the building of the new navy was begun), professors of mathematics, civil engineers and chaplains. The highest rank was admiral, that rank which expired at Adm. Porter's death 1891, having been revived for Rear-Admiral Dewey, the rank of vice-admiral having ceased to exist, by operation of law, on the death of Vice-Admiral Rowan (q.v.) 1890. In 1895 the personnel of the navy comprised 726 officers and 8,250 enlisted men and boys, and a marine corps of 2,177 officers and men. The active list 1902 comprised 1 admiral, 24 rear-admirals, 75 captains, 118 commanders, 177 lieutenant-commanders, 306 lieutenants, 73 lieutenants of the junior grade, 138 ensigns, 125 midshipmen, 15 medical directors, 15 medical inspectors, 56 surgeons, 53 asst. surgeons, 13 pay directors, 14 pay inspectors, 40 paymasters, 30 passed asst. paymasters, 30 asst. paymasters, 24 chaplains, 12 professors of mathematics, 23 naval constructors, 20 asst. naval constructors, 24 civil engineers. Navy yards were maintained at Boston, Portsmouth, New York, Philadelphia, Washington, D. C., Norfolk, Pensacola, San Francisco, and Algiers, La.; naval stations at New London, Port Royal, Key-West, and Bremerton, Wash.; naval hospitals at Boston, New York, Philadelphia, Washington, Norfolk, San Francisco, and Yokohama, Japan; receiving ships at Boston, New London, New York, Philadelphia, Norfolk, and San Francisco; a naval war college and torpedo station at Newport; a training station on Yerba Buena Island, Cal.; proving grounds for new ordinance at Indian Head, Md. and Sandy Hook, N. J.; a naval ob-

servatory at Washington; public marine schools at Boston, New York, and Philadelphia. There were 5 cruising stations for vessels in commission, known as the N. Atlantic, Pacific, Asiatic, European, and S. Atlantic; and the names of these stations were given to the various squadrons among which the commissioned vessels were distributed. The development of the new navy occasioned a change in the rating and nomenclature of the vessels, and (1895) a renaming of the various parts of the vessel. Vessels of 11,000 tons and upward are rated as first-class and named after the states; and vessels of 3,000—5,000 tons are rated as second-class and named after cities. The pay of petty officers, enlisted men, and boys ranging from $70 per month (machinists) to $9 (third-class apprentices). Every officer, seaman, and marine in the navy has 20 cents per month deducted from his pay, which goes into a general fund for the support of naval hospitals. The pay of superior officers is according to the following table:

TABLE OF PAY ALLOWED BY LAW TO THE OFFICERS OF THE U. S. NAVY.

Rank.	At Sea.	On Shore Duty.
Admiral	$13,500	$13,500
Rear Admirals:		
First nine	7,500	6,375
Second nine	5,500	4,675
Major General Commandant of Marine Corps	.....	7,500
Chiefs of Bureaus	.....	5,500
Captains, Navy	3,500	2,975
Judge-Advocate-General and Colonels, Marine Corps, line and staff	3,500	3,500
Commanders, Navy	3,000	2,550
Lieutenant-Colonels, Marine Corps, line and staff	3,000	3,000
Lieutenant-Commanders, Navy	2,500	2,125
Majors, Marine Corps, line and staff	2,500	2,500
Lieutenants, Navy	1,800	1,530
Captains, Marine Corps:		
Line	1,800	1,800
Staff	2,000	2,000
Lieutenants (junior grade), Navy	1,500	1,275
First Lieutenant and leader of band, Marine Corps	1,500	1,500
Ensigns, Navy	1,400	1,190
Second Lieutenants, Marine Corps, Chief Boatswains. Chief Gunners, Chief Carpenters and Chief Sailmakers	1,400	.....
Midshipmen:		
In other than practice ships	950	1,400
At Naval Academy and elsewhere	500	500
Captains	2,500	2,000
Professors of Mathematics and Civil Engineers	2,400	2,400
Naval Constructors	3,200	3,200
Assistant Naval Constructors	2,000	2,000
Warrant Officers:		
Boatswains, Gunners, Carpenters, Sailmakers, Pharmacists and Warrant Machinists	1,200	900
Mates:		
Those in service 1894, August 1	1,200	900
Those appointed since	900	700

UNITED STATES NAVY.

Officers are retired—after 40 years' service, or on attaining the age of 62 years, or from incapacity resulting from long service, wounds, injuries, exposure, or sickness received in or resulting from the discharge of duty—on 75 per cent. of the pay received at the time of retirement. Naval cadets, after leaving Naval Acad., *at sea*, in other than practice-ships, receive $950 per annum.

SHIPS OF THE U. S. NAVY AS REPORTED 1903, JAN. 1.

First Rate.

Name.	Displacement (tons)	Type.	Hull.	I.H.P.	Propulsion.	Guns (main battery).
Maine	12,500	1st-class battleship	S	16,000	T S	20
Alabama	11,525	"	S	11,366	T S	18
Illinois	11,525	"	S	11,366	T S	18
Wisconsin	11,525	"	S	10,000	T S	18
Kearsarge	11,525	"	S	11,954	T S	22
Kentucky	11,525	"	S	12,318	T S	22
Iowa	11,340	"	S	12,105	T S	18
Indiana	10,288	"	S	9,738	T S	16
Massachusetts	10,288	"	S	10,403	T S	16
Oregon	10,288	"	S	11,111	T S	16
Brooklyn	9,215	Armored cruiser	S	18,769	T S	20
New York	8,200	"	S	17,401	T S	18

Second Rate.

Columbia	7,373	Protected cruiser	S	18,509	TrS	11
Minneapolis	7,375	"	S	20,862	TrS	11
Texas	6,315	2d-class battleship	S	8,610	T S	8
Puritan	6,060	Dble-turret mont'r	I	3,700	T S	10
Olympia	5,870	Protected cruiser	S	17,313	T S	14
Chicago	5,000	"	S	9,000	T S	18
Yankee	6,888	Cruiser (conv'td)	I	3,800	S	10
Prairie	6,872	"	I	3,800	S	10
Buffalo	6,888	"	S	3,600	S	6
Dixie	6,145	"	S	3,800	S	10
Baltimore	4,413	Protected cruiser	S	10,064	T S	10
Philadelphia	4,324	"	S	8,815	T S	12
Newark	4,098	"	S	8,869	T S	12
San Francisco	4,098	"	S	9,913	T S	12
Monterey	4,084	Barbette-tur't, low free board monitor	S	5,244	T S	4
Monadnock	4,005	Dble-turret mont'r	I	3,000	T S	6
Hancock	(a)	Transport	I	4,000	S	....

Third Rate.

Ajax	a 7,500	Collier	S	3,000	S	c 2
Glacier	a 7,000	Refrigerator ship	S	.....	S	c 3
Celtic	6,428	"	S	1,890	S	....
Culgoa	a 6,300	Supply ship	S	b 1,500	....	....
Saturn	a 6,220	Collier	I	1,500	S	c 2
Rainbow	6,206	Cruiser (conv'td)	S	1,800	S	....
Arethusa	a 6,200	Tank steamer	S	.....	S	....
Alexander	6,181	Collier	S	1,026	S	c 2
Iris	6,100	Supply & rep'r ship	S	1,300	S	....
Brutus	a 6,000	Collier	S	1,200	S	c 2
Sterling	5,663	"	T	a 926	S	c 2
Cæsar	5,016	"	S	1,500	S	c 4
Nero	4,925	"	S	1,000	S	c 4
Nanshaw	a 4,827	"	S	.....	....	....
Abarenda	4,670	"	S	1,050	S	c 4
Supply	4,460	Supply ship	I	1,069	S	c 2
Marcellus	4,400	Collier	I	1,200	S	c 2
Hannibal	4,291	"	S	1,100	S	c 2
Leonidas	4,242	"	S	1,000	S	c 2

UNITED STATES NAVY.

SHIPS OF THE U. S. NAVY AS REPORTED 1903, JAN. 1.—*Continued.*

Third Rate.

Name.	Displacement (tons)	Type.	Hull.	I.H.P.	Propulsion.	Guns (main battery).
Solace	4,700	Hospital ship	S	3,200	S	....
Panther	4,260	Cruiser (conv'td)	I	.....	S	8
Miantonowoh	3,990	Dble-turret mont'r	I	1,426	T S	4
Amphitrite	3,990	"	I	1,600	T S	6
Terror	3,990	"	I	1,600	T S	4
Albany	3,437	Protected cruiser	S W	7,500	T S	10
New Orleans	3,437	"	S W	7,500	T S	10
Lancaster	3,250	Cruiser	W	1,000	S	12
Arkansas	3,214	Monitor	S	2,400	T S	6
Wyoming	2,214	"	S	2,400	T S	6
Cincinnati	3,213	Protected cruiser	S	10,000	T S	11
Raleigh	3,213	"	S	10,000	T S	11
Reina Mercedes	3,090	"	S	3,700	S	....
Atlanta	3,000	"	S	4,030	S	8
Boston	3,000	"	S	4,030	S	8
Hartford	2,790	Cruiser	W	2,000	S	13
Mayflower	2,690	Cruiser (conv'td)	S	4,700	T S	2
Topeka	2,372	Gunboat	I	2,000	T S	8
Katahdin	2,155	H'bor-defense ram	S	5,068	T S	4
Canonicus	2,100	S'gle-turret mont'r	I	340	S	2
Detroit	2,089	Unprotec'd cruiser	S	5,227	T S	10
Montgomery	2,089	"	S	5,580	T S	10
Marblehead	2,089	"	S	5,451	T S	10
Mohican	1,900	Cruiser	W	1,100	S	6
Jason	1,875	S'gle-turret mont'r	I	340	S	2
Lehigh	1,875	"	I	340	S	2
Montauk	1,875	"	I	340	S	2
Nahant	1,875	"	S	340	S	2
Manila	1,800	Gunboat	I	750	S	2
Bennington	1,710	"	I	3,436	T S	6
Concord	1,710	"	S	3,405	T S	6
Yorktown	1,710	"	S	3,392	T S	6
Dolphin	1,486	Dispatch boat	S	2,253	S	3
Welmington	1,392	Light-draft gun'bt	S	1,894	T S	8
Helena	1,392	"	S	1,988	T S	8
Adams	1,375	Cruiser	W	800	S	6
Essex	1,375	"	W	800	S	6
Enterprise	1,375	"	W	800	S	1
Nashville	1,371	Light-draft gun'bt	S	2,556	T S	8
Monocacy	1,370	"	I	850	P	6
Castine	1,177	Gunboat	S	2,199	T S	8
Machias	1,177	"	S	2,046	T S	8
Chesapeake	1,175	"	C'p	.....	S's	6
Don Juan de Austria	1,159	"	I	1,500	S	4
Isle de Luzon	1,030	"	S	2,627	T S	6
Isla de Cuba	1,030	"	S	2,627	T S	6
Alert	1,020	Cruiser	I	500	S	3
Ranger	1,020	"	I	500	S	6
Annapolis	1,000	Composite gunboat	C'p	1,227	S	6
Vicksburg	1,000	"	C'p	1,118	S	6
Wheeling	1,000	"	C'p	1,081	T S	6
Marietta	1,000	"	C'p	1,054	T S	6
Newport	1,000	"	C'p	1,008	S	6
Princeton	1,000	"	C'p	800	S	6
Lawton	.....	a Transport	S	3,200	S	....
Relief	.....	Hospital ship	S	2,666	S	....

Fourth Rate.

Lebanon	3,375	Collier	I	.....	S	c 4
Justin	3,300	"	S	.....	S	c 2
Southery	b 3,100	"	I	.....	S	c 2
Pompey	b 3,085	"	S	.....	S	c 2

UNITED STATES NAVY.

SHIPS OF THE U. S. NAVY AS REPORTED 1903. JAN. 1.—*Continued.*

Fourth Rate.

Name.	Displacement (tons)	Type.	Hull.	I.H.P.	Propulsion.	Guns (main battery).
Zafiro	b 2,000	Transport	S	.....	.	....
General Alava	1,400	"	S	750	S	c 4
Yankton	975	Gunboat (conv'td)	S	750	S	c 8
Vesuvius	929	Dynamite gun ves'l	S	3,795	T S	c 3
Petrel	892	Gunboat	S	1,095	S	4
Scorpion	850	Gunboat (conv'td)	S	2,800	T S	c 8
Fern	840	Tender	W	300	S	c 3
Bancroft	839	Gunboat	S	1,213	T S	4
Vixen	806	Gunboat (conv'td)	S	1,250	S	c 4
Gloucester	786	"	S	2,000	S	c10
Michigan	685	Cruiser	I	365	P	c 6
Wasp	630	Gunboat (conv'td)	S	1,800	S	b 6
Frolic	607	"	S	550	S	b 4
Dorothea	594	"	S	1,558	S	c10
Elcano	560	Gunboat	S	600	T S	....
Pinta	550	"	I	310	S	c 2
Stranger	b 546	Gunboat (conv'td)	I	.....	S	c 5
Peoria	488	"	S	.....	S	c 7
Hist	472	"	S	500	S	c 6
Eagle	434	"	S	850	S	c 6
Hornet	425	"	S	800	S	c 9
Quiros	400	Gunboat	C'p	208	S	c 2
Yillabobos	400	"	C'p	208	S	c 2
Hawk	375	Gunboat (conv'td)	S	1,000	S	c 4
Siren	b 315	"	S	.....	S	c 4
Sylvia	b 302	"	I	.....	S	c 6
Callao	200	Gunboat	S	250	T S	c 6
Pampanga	200	"	I	250	T S	c 4
Paragua	200	"	I	250	T S	c 4
Samar	200	"	I	250	T S	c 4
Arayat	200	"	I	260	T S	c 6
Aileen	192	Gunboat (conv'td)	S	500	S	c 5
Murdanao	174	Gunboat	I	100	T S	c 6
Elfrida	b 173	Gunboat (conv'td)	S	200	S	c 2
Sylph	152	"	S	550	S	c 8
Calamianes	150	Gunboat	I	125	T S	c 3
Albay	150	"	I	125	T S	c 3
Leyte	150	"	I	125	T S	c 3
Oueida	150	Gunboat (conv'td)	W	250	S	c 6
Panay	142	Gunboat	I	125	T S	c 4
Manileño	142	"	I	125	T S	c 4
Mariveles	142	"	I	125	T S	c 4
Murdoro	142	"	I	125	T S	c 4
Restless	137	Gunboat (conv'td)	I	500	S	c 8
Shearwater	122	"	S	.....	S	c 3
Inca	b 120	"	W	400	S	c 2
Alvarado	100	Gunboat	S	137	S	c 2
Sandoval	100	"	S	137	S	c 2
Huntress	82	Gunboat (conv'td)	C'p	.....	S	c 2
Basco	42	Gunboat	I	44	S	c 2
Gardoqui	42	"	I	44	S	c 2
Urdaneta	42	"	I	44	S	c 2

Topedo Vessels.

Decatur	420	Torp. boat des.	S	8,000	T S	c 2
Perry	420	"	S	7,000	T S	c 2
Prebie	420	"	S	7,000	T S	c 2
Dale	420	"	S	8,000	T S	c 2
Truxtun	433	"	S	8,300	T S	c 2
Whipple	433	"	S	8,300	T S	c 2
Chauncey	420	"	S	8,000	T S	c 2
Barry	420	"	S	8,000	T S	c 2

UNITED STATES NAVY.

SHIPS OF THE U. S. NAVY AS REPORTED 1903, JAN. 1.—*Continued.*

Torpedo Vessels.

Name.	Displacement (tons)	Type.	Hull.	I.H.P.	Propulsion.	Guns (main battery).
Bainbridge	420	Torp. boat. des.	S	8,000	T S	c 2
Worden	420	"	S	8,300	T S	c 2
Stewart	420	"	S	7,000	T S	c 2
Paul Jones	420	"	S	7,000	T S	c 2
Cushing (No. 1)	120	Torpedo boat	S	1,720	T S	d 3
Ericsson (No. 2)	120	"	S	1,800	T S	d 3
Foote (No. 3)	142	"	S	2,000	T S	d 3
Rodgers (No. 4)	142	"	S	2,000	T S	d 3
Winslow (No. 5)	142	"	S	2,000	T S	d 3
Porter (No. 6)	165	"	S	b 3,400	T S	d 3
Dupont (No. 7)	165	"	S	b 3,400	T S	d 3
De Long	165	"	S	3,000	T S	d 3
Rowan (No. 8)	182	"	S	3,200	T S	d 3
Dehlgren (No. 9)	146	"	S	4,200	T S	d 2
T.A.M.Craven(No10)	146	"	S	4,200	T S	d 2
Farragut (No. 11)	273	"	S	5,600	T S	d 2
Davis (No. 12)	132	"	S	1,750	T S	d 3
Fox (No. 13)	132	"	S	1,750	T S	d 3
Morrls (No. 14)	105	"	S	1,750	T S	d 3
Talbot (No. 15)	46½	"	S	850	S	d 2
Guin (No. 16)	46	"	S	850	S	d 2
Mackenzie (No. 17)	65	"	S	850	S	d 2
Wilkes (No. 36)	165	"	S	3,000	T S	c 3
Bailey (No. 21)	235	"	S	5,600	T S	d 2
Somers (No. 22)	145	"	S	1,900	S	d 2
Manly (No. 23)	b 30	"	S	b 250	S	d 1
Bagley (No. 25)	167	"	S	4,200	T S	d 3
Barney (No. 26)	167	"	S	4,200	T S	d 3
McKee (No. 18)	65	"	S	850	S	d 2
Biddle (No. 27)	167	"	S	4,200	T S	d 3
Shubrick (No. 33)	166	"	S	3,000	T S	d 3
Stockton (No. 33)	166	"	S	3,000	T S	d 3
Thornton	165	"	S	3,000	T S	c 3
Stiletto (No. 53)	31	"	W	359	S	d 2
Holland (No. 54)	73	Sub. Torpedo boat	S	150	S	d 1

Tugs.

Accomac	187	Tug	I	250	S	c 2
Active	296	"	S	600	S	c 5
Alice	356	"	W	250	S	c 2
Apache	650	"	W	550	S	c 3
Chickasaw	100	"	I	.....	S	c 1
Choc aw	350	"	I	188	S	c 3
Fortune	450	"	I	340	S	....
Hercules	198	"	I	.....	S	c 3
Iroquois	202	"	S	1,000	S	c 3
Iwana	192	"	S	300	S	....
Leyden	450	"	I	340	S	....
Massasoit	202	"	S	.....	S	c 1
Modoc	241	"	I	.....	S	....
Mohawk	420	"	S	400	S	....
Narketta	192	"	S	300	S	....
Nezinscot	156	"	S	400	S	c 2
Nina	357	"	I	388	S	....
Osceola	571	"	S	.....	S	c 2
Pawnee	275	"	W	250	S	....
Pawtucket	225	"	S	450	S	....
Penacook	225	"	S	450	S	....
Piscataqua	631	"	S	1,600	S	c 4
Pontiac	401	"	....	425	S	c 3
Potomac	677	"	S	2,000	S	c 4

UNITED STATES NAVY.

SHIPS OF THE U. S. NAVY AS REPORTED 1903, JAN. 1.—*Continued.*

Tugs.

Name.	Displacement (tons)	Type.	Hull.	I.H.P.	Propulsion	Guns (main battery).
Powhatan	194	Tugs	S	397	S	c 2
Rapido	100	"	S	70	S	c 1
Samoset	225	"	S	450	S	....
Sebago	190	"	S	.....	S	c 1
Sioux	155	"	....	290	S	c 2
Standish	450	"	I	340	S	c 1
Tecumseh	214	"	S	500	S	c 2
Traffic	280	"	W	.....	S	....
Triton	212	"	S	300	S	....
Unadilla	345	"	S	500	S	....
Uncas	441	"	S	750	S	c 2
Vigilant	300	"	....	450	S	c 5
Wabau	150	"	I	.....	....	c 1
Wahneta	192	"	S	300	S	....
Wompatuck	462	"	I	650	S	c 2

Sailing Ships.

Alliance	b 375	.....	W	.....	S's	6
Monongahela	2,100	.....	W	.....	"	6
Constellation	1,186	.....	W	.....	"	8
Jamestown	1,150	.....	W	.....	"	....
Portsmouth	1,125	.....	W	.....	"	12
Saratoga	1,025	.....	W	.....	"	....
St. Mary's	1,025	.....	W	.....	"	....

Wooden Receiving Ships.

Franklin	5,170	.....	W	.....	....	....
Wabash	4,650	.....	W	.....	....	....
Independence	3,270	.....	W	.....	....	....
Pensacola	3,000	.....	W	.....	....	....
Richmond	2,700	.....	W	.....	....	....
Nipsic	1,375	.....	W	.....	....	....

Unserviceable.

New Hampshire	4,150	Sailing ship	W	.....	S's	2
Oma a	2,400	Cruiser	W	.....	....	....
Constitution	2,200	Sailing ship	W	.....	....	4
Iroquois	1,575	Cruiser	W	.....	....	....
St. Louis	830	Sailing ship	W	.....	....	....
Dale	675	"	W	.....	....	....
Minnesota	4,700	Cruiser	W	.....	....	9
Marion	1,900	"	W	1,100	S	8
Yantic	900	"	W	310	S	4

Under Construction.

Missouri	12,500	1st-class battleship	S	16,000	T S	20
Ohio	12,500	"	S	16 000	T S	20
Georgia	15,000	"	S W	18,000	T S	24
New Jersey	15,000	"	W	18.000	T S	24
Nebraska	15,000	"	S W	18,000	T S	24
Virginia	14,600	"	S	18,000	T S	24
Rhode Island	14,600	"	S	18,000	T S	24
California	14,000	Armored cruiser	S W	23,000	T S	22
Pennsylvania	14,000	"	S W	23,000	T S	22
West Virginia	14,000	"	S W	23,000	T S	22
Maryland	13,600	"	S	28,000	T S	22
Colorado	13,600	"	S	23,000	T S	22
South Dakota	13,600	"	S	23.000	T S	22
St. Louis	9,600	Protected cruiser	S	21,000	T S	14
Milwaukee	9,600	"	S	21,000	T S	14
Charleston	9,600	"	S	21,000	T S	14
Chattanooga	3,100	"	S W	4,700	T S	10

UNITED STATES NAVY.

SHIPS OF THE U. S. NAVY AS REPORTED 1903, JAN. 1.—*Continued.*

Under Construction.

Name.	Displacement (tons)	Type.	Hull.	I.H.P.	Propulsion.	Guns (Main battery).
Cleveland.	3,100	Protected cruiser	S W	4,700	T S	10
Denver.....	3,100	"	S W	4,700	T S	10
Des Moines	3,100	"	S W	4,700	T S	10
Galveston	3,100	"	S W	4,700	T S	10
Tacoma.....	3,100	"	S W	4,700	T S	10
Gunboat No. 16.....	.....	Gunboat	S	.....	T S	....
Nevada.....	3,214	Monitor	S	2,400	T S	6
Flo ida	3,214	"	S	2,400	T S	6
Hopkins (No. 42) ...	408	Top. boat des.	S	7,200	T S	d 2
Hull (No. 43)..	408	"	S	7,200	T S	d 2
Laurence (No. 44)..	400	"	S	8,400	T S	d 2
Macdonough (No.45)	400	"	S	8,400	T S	d 2
Stringham (No. 19).	340	Torpedo boat	S	7,200	T S	d 2
Goldsborough(No20)	247½	"	S	6.000	T S	d 2
Blakely (No. 28).....	165	"	S	3,000	T S	d 3
Nicholson (No. 30)..	174	"	S	3,000	T S	d 3
O'Brien (No. 31).....	174	"	S	.....	T S	d 3
Tingey (No. 35).....	165	"	S	3,000	T S	d 3
Plunger (No. 24)....	120	Sub. Topedo boat	S	160	S	d 1
Adder (No. 55).....	120	"	S	160	S	d 1
Grampus (No. 56)...	120	"	S	160	S	d 1
Moccasin (No. 57)...	120	"	S	160	S	d 1
Pike (No. 58).....	120	"	S	160	S	d 1
Porpoise (No. 59)....	120	"	S	160	S	d 1
Shark (No. 60).....	120	"	S	160	S	d 1

ABBREVATIONS.—*Hull* : S., steel ; I., iron ; W , Wood. I. H. P., in dicated horse power. *Propulsion :* S., screw : T. S., twin screw ; Tr. S., triple screw ; P., paddle ; M. P., Mallory propeller. a, exact figures not known ; b, estimated; c, Secondary battery ; d, Torpedo Tubes ; c'p, composite ; s's sails.

NAVAL RESERVES.—In 1888 congress passed a bill authorizing the seaboard states to organize and maintain battalions of naval militia, which in time of war could be called into active service and assigned to duty in manning coast and harbor defense vessels and in operating torpedoes against hostile fleets, while the regular naval forces were engaged elsewhere. To encourage the formation of such battalions, the bill provided that they should be organized under the supervision of the military authorities of the states indicated; that they should become a part of the regular state militia; and that when a governor certified to the sec. of the navy that such a battalion had been regularly organized and incorporated with the militia of his state, the sec. should place at the disposal of the governor one of the vessels of the navy for the use of the battalion in acquiring thorough naval instruction. Under this law, naval militia had been organized in Mass., R. I., Conn., N. Y., Penn., N. J., Md., N. C., S. C., Ga., Cal., Ill., and Mich., up to 1895, July; and in Va., La., and other seaboard states organization was then in progress. Several states had two and three divisions each of their naval militia, and the following assignments of naval vessels had been made: Mass., the *Passaic;* Conn., the *Wyandotte;* N. Y., the *New Hampshire;* N. J., the *Portsmouth;* Penn., the *St. Louis;* Md., the *Dale;* N. C., the *Nantucket;* and Cal., the *Swatara.* The various battalions comprised over 3,000 officers and men, were composed of the best class of the young citizenship, and were commanded by officers nearly all of whom had had experience in the regular navy. The older battalions, those of Mass. and N. Y., had had practical instruction for several days on modern men-of-war, and had fully justified the belief that the system would provide an invaluable adjunct to the navy in time of war.

All matters relating to the naval militia come under the cognizance of the asst. secretary of the navy, business being transacted through the governors and the adjutant-generals of the states. Total number of commissioned officers, Jan. 1, 1902, 433; petty officers and men, 4,447, representing 16 states and the District of Columbia. The vessels used for instruction numbered 8.

UNITED STATES OF AMERICA, THE: republic in N. America: bounded n. by the Dominion of Canada, e. by the Atlantic Ocean, s. by Mexico and the Gulf of Mexico, w. by the Pacific Ocean; with Alaska, bounded n. by the Arctic Ocean, e. by the British Northwest Territories, s. by the Pacific Ocean, w. by Behring Sea. It comprised (1903) 1 federal dist., 45 states, and 7 territories, and was organized with 13 states, which, in the order of their ratification of the federal constitution, are: Del., Penn., N. J. Ga., Conn., Mass., Md., S. C., N. H., Va., N. Y., N. C., and R. I. The states, since admitted to the Union are, in the order of their admission, Vt., 1791, Mar. 4; Ky., 1792, June 1; Tenn., 1796, June 1; O., 1802, Nov. 29; La., 1812, Apr. 30; Ind., 1816, Dec. 11; Miss., 1817, Dec. 10; Ill., 1818, Dec. 3; Ala., 1819, Dec. 14; Me., 1820, Mar. 15; Mo., 1821, Aug. 10; Ark., 1836, June 15; Mich., 1837, Jan. 26; Fla., 1845, Mar. 3; Tex., 1845, Dec. 29; Io., 1846, Dec. 28; Wis., 1848, May 29; Cal., 1850, Sep. 9; Minn., 1858, May 11; Or., 1859, Feb. 14; Kan., 1861, Jan. 29; W. Va., 1863, June 19; Nev., 1864, Oct. 31; Neb., 1867, Mar. 1; Colo., 1876, Aug. 1; N. D. and S. D., 1889, Nov. 2; Mont., 1889, Nov. 8; Wash., 1889, Nov. 11; Ida., 1890, July 3; Wyo., 1890, July 11; Utah, 1896, Jan 4. The federal dist., District of Columbia. was organized under acts of congress 1790, July 16, and 1791, Mar. 3. The territories are: the Indian Terr. (without territorial govt.), 1834, June 30; New Mexico, 1850, Sep. 9; Arizona, 1863, Feb. 24; Alaska, 1868, July 27; Okl., 1890, May 2; Porto Rico, 1898; and Hawaii, 1900.—For details concerning the states and territories, see their respective titles.

Location and Area.—Excluding Alaska (q.v.), the U. S. is in lat. 24° 20′—49° n., long. 66° 48′—124° 32′ w.; extreme width e. to w. 3,100 m.; extreme length n. to s. 1,780 m.; Atlantic coast-line 2,163 m., Pacific 1,343, Gulf of Mexico 1,764—total 5,270—total with islands, bays, and inlets 21,354 m.; n. land and water boundary (Brit. frontier) 3,475 m., s. land and water boundary 2,105 m., total ocean, land, lake, and river boundary 10,855 m. The gross area of Alaska is 90,884 sq. m.; Hawaii, 6,447; Porto Rico, 3,600. The areas in sq. m. of the states and territories as determined by the 1900 census are:

States and Territories	Gross Area.	Water Surface.	Land Surface	States and Territories	Gross Area.	Water Surface.	Land Surface.
Total*...	3,025,600	55,600	2,970,000	Ida.....	84,800	510	84,290
				Ill	56,650	650	56,000
Ala.....	52,250	710	51,540	Ind.....	36,350	440	35,910
Ariz.....	113,020	100	112,920	Ind. Terr..	31,400	400	31,000
Ark.	53,850	805	53,045	Io.....	56,025	550	55,475
Cal.	158,360	2,380	155,980	Kan... ...	82,080	380	81,700
Colo.....	103,925	280	103,645	Ky.	40,400	400	40,000
Conn.....	4,990	145	4,845	La....	48,720	3,300	45,420
Del.....	2,050	90	1,960	Me.	33,040	3,145	29,895
D. C.....	70	10	60	Md.....	12,210	2,350	9,860
Fla.....	58,680	4,440	54,240	Mass.....	8,315	275	8,040
Ga	59,475	495	58,980	Mich.	58,915	1,485	57,430

* With Alaska, Porto Rico and Hawaii, 3,626,533 sq, m.

States and Territories	Gross Area.	Water Surface.	Land Surface	States and Territories	Gross Area.	Water Surface.	Land Surface.
Minn.....	83,365	4,160	79,205	R. I.....	1,250	165	1,085
Miss.....	46,810	470	46,340	S. C.....	30,570	400	30,170
Mo.....	69,415	680	68,735	S. D.....	77,650	800	76,850
Mont.....	146,080	770	145,310	Tenn.....	42,050	300	41,750
Neb.....	77,510	670	76,840	Tex.	265,780	3,490	262,290
Nev.	110,700	960	109,740	Utah.....	84,970	2,780	82,190
N. H . ..	9,305	300	9,005	Vt..	9,565	430	9,135
N. J	7,815	360	7,455	Va.....	42,450	2,325	40,125
N. Mex....	122,580	120	122,460	Wash.....	69,180	2,300	66,880
N. Y..	49,170	1,550	47,620	W. Va. ...	24,780	135	24,645
N. C.....	52,250	3,670	48,580	Wis.....	56,040	1,590	54,450
N. D.... ..	70,795	600	70,195	Wyo..... ..	97,890	315	97,575
O..	41,060	300	40,760				
Okl.	39,030	200	38,830	Del. Bay ..	620	620	....
Or....	96,030	1,470	94,560	Raritan & Lower N. Y. Bays..	100	100	...
Penn	45,215	230	44,985				

Topography.—Two great systems of mountain ranges extend through the U. S.—the Appalachian on the e., and the Cordilleras on the w. The first has a general elevation of 300–1,000 ft., and an extreme width of 200 m.; and the other an elevation of from 4,000 to more than 12,000 ft. (in the Sierra Nevada), and an extreme width of 1,000 m. (see titles of the principal ranges). There are four principal divisions of rivers: n. lake, Atlantic, Pacific, and Gulf. The first embraces 184,339 sq. m. of territory; the second 304,538 sq. m.; the third 1,683,303 sq. m.; and the fourth 854,314 sq. m. (see titles of the principal rivers). The principal lakes are the cluster of five known as the 'Great Lakes,' and comprising Superior, Ontario, Michigan, Erie, and Huron (see each), and Lake Champlain (q.v.). See AMERICA.

Geology.—The e. geographical area, extending from the Atlantic Ocean to the Rocky Mountains, is occupied chiefly by Paleozoic rock, with a w. boundary of crystalline Eozoic formation; and the w. area, from the Rocky Mountains to the Pacific Ocean, shows the crystalline Eozoic overlaid by the Paleozoic limestones of the Carboniferous age, and the more recent Secondary and Tertiary formations, broken by eruptive rocks. The soil is of every variety, from the sterile deserts of the great w. plains and Utah to the inexhaustible fertility of the bottom-lands of the Mississippi valley, where heavy crops of maize have grown for 50 successive years without manuring. The Atlantic slope from Me. to N. J., e. of the Hudson, is hilly and but moderately fertile; more southerly, the coast-belt is low, sandy, in places swampy, with pine-barrens, the inland region fertile, and among the best in the country. The Mississippi valley is generally level, and prairie-land of unsurpassed fertility, with a rich mold, in places 25 ft. deep. N.w. the country rises to a high and sterile region, extending 200 to 400 m. from the base of the Rocky Mts. The Texas slope has rich bottom-lands on the coast, a fine rolling fertile country, rising to a high plateau which is dry and sterile except in river-bottoms. The Pacific slope is generally sterile, except the great valleys between

the mountain ranges and bordering the rivers, which are of great fertility. The country e. of the Mississippi, except the prairies of Ill. and Ind., was, at its settlement, heavily wooded, and there are still vast forests of valuable timber in that region, as also in the south. W. of the 97th meridian stretches a vast region of almost treeless prairies; forests again occur in the Rocky Mts., and in Cal., Or., and Wash. For the flora and fauna, see the relevant sections in AMERICA (*Botany, Zoology, Geology,* etc.).

Mineralogy.—As appears from the table following, the United States is rich in mineral productions. Coal is found in every state except Me., N. H., Vt., N. J., Del., S. C., La., Miss., Minn., Wis., and Nev. The area of the coal-measures is estimated at 300,000 sq. m. The whole extent of the coal-area has been divided into four principal coal-fields or tracts—viz., the great central Alleghanian or Appalachian coal-field, extending from Ala., through e. Tenn. and Ky., W. Va., Md., O., and Penn. This field has been computed to cover 50,000 to 60,000 sq. m., of which about 40,000 sq. m. are considered workable. The second coal-field occupies the greater part of Ill. and Ind., and in extent is nearly equal to the first. A third field covers a large portion of Mo.; and the fourth, of Mich. The petroleum springs are a source of great wealth: see PETROLEUM. Beds of rich marl are found in several eastern states, and, in many, nitrates and carbonates of soda and potassia, gypsum, and marble of great variety, and some of rare beauty. Iron is found in all parts, from the pure metal in mountain masses to bog-ore; and in many places in close proximity to coal. Lead exists in rich deposits in Mo., Ark., Ill., Io., etc. Copper is found in several states, and in great quantities of ores of 71 to 90 per cent. on the borders of Lake Superior. Zinc occurs in N. J. and Penn. There are rich silver mines in Colo., Nev., Utah. N. Mex., Ariz., and Cal. Gold is found in small quantities in some of the Atlantic coast states; in great quantities in Cal., Or., Colo., Nev., Wash., Ariz., N. Mex., and Mont. There are also found platinum and mercury in Cal., osmium and iridium in Or., cobalt in N. C. and Mo.. and nickel in Conn. and Penn.

Climate.—For a particular account of the climate of the United States, see RAIN: TERRESTRIAL TEMPERATURE. It is remarkable for wide transitions of cold and heat, rain and drought, except in the peninsula of Fla., where the temperature varies but 12° F., and w. Or. and Wash., where the climate is more equable. With few exceptions, the summers are hot in both the north and south, the thermometer rising at times above 100° F.; and along the n. range of states sinking in winter to −20°, and even sometimes as low as −40°. The whole Atlantic coast has a winter temperature 10° lower than that of w. Europe in the same latitude. Thus, at New York, in the latitude of Madrid, the Hudson river is sometimes frozen, and the harbor filled with floating ice. In the w., from the shores of the Pacific to the Cascade Mts., the climate is mild and

humid, with frequent showers at all seasons. But the great valley between the Cascade and the Rocky Mts. is almost entirely rainless, because the w. winds are drained of their moisture in crossing the Cascade Mts. before arriving there. In winter it is covered with snow, but in summer is dry and arid. However, the copious streams poured down from the melting snow give abundant facilities for irrigation, so that its capabilities and resources are great, when properly developed. The country e. of the Rocky Mts. depends for its rain on the Gulf of Mexico; and the rainfall there is distributed most in the low plains, and least on the plateaux and mountains. Hence over this extensive district southerly winds are warm and moist, and westerly and northerly dry and cold. The result is rapid alternations of temperature, occasionally through a range of 50° or 60° in the course of a day. In the New England states the n. and e. winds are moist and chilly, accompanied with frequent fogs. The climate of the states surrounding the great lakes in the n. is mild and moist in summer as compared with the other n. states; but in winter, when the lakes are frozen, a degree of cold is experienced greater, absolutely and relatively, than elsewhere in the country.

Mineral Productions.—The following table gives a summary of the mineral productions of the U. S. in the calendar year 1901, the latest reported by the U. S. geological survey office at the time of writing (see also GOLD: SILVER: ETC.):

Products.	Quantity.	Value.
METALLIC PRODUCTS.		
Pig iron.....long tons	15,878,354	$242,174,000
Silver, coining value.....troy oz.	59,653,788	77,126,382
Copper, value New York.....lbs.	597,443,212	86,629,266
Gold, coining value.....troy oz.	3,880,578	80,218,800
Lead, value New York.....short tons	270,700	23,280,200
Zinc, " " " ..... " "	140,822	11,265,760
Quicksilver, value San Fran.....flasks	29,727	1,382,305
Nickel, value Philadelphia.....lbs.	6,700	3,551
Aluminum, value Philadelphia ..... "	7,150,000	2,238,000
Antimony, value New York...short tons	2,649	542,020
Platinum, value New York.....troy oz.	1,827	13,000
Total.....	.....	$524,873,284
NON-METALLIC (*value at mine, quarry, pit, etc.*		
Bituminous coal.....long tons	225,607,649	$236,201,899
Penn. anthracite..... " "	60,242,560	112,504,020
Building stone.....	.....	55,615,926
Natural gas.....	.....	27,067,500
Petroleum.....bbls.	69,389,194	66,417,335
Cement..... "	20,068,737	15,786,789
Salt..... "	20,566,661	6,617,449
Limestone (iron flux).....long tons	8,540,168	4,659,836
S. C. phosphate rock..... " "	1,483,723	5,316,403
Mineral waters.....gals. sold	55,771,188	7,586,962
Zinc-white.....short tons	38,889	3,111,120
Gypsum..... " "	659,659	1,577,493
Borax.....crude tons	17,887	314,811
Mineral paints.....long tons	61,460	789,962

Products.	Quantity.	Value.
Asphaltum ..... short tons	63,134	$555,335
Manganese ore..... long "	11,995	116,722
Flint..... " "	34,420	149,297
Pyrites..... " "	234,825	1,024,449
N. J. marls..... short tons	60,000	30,000
Crude barytes..... long "	49,070	157,844
Bromine..... lbs.	552,043	154,572
Corundum and Emery..... short tons	4,305	146,040
Mica..... lbs.	360,060	98,859
Precious stones..... "	.....	289,050
Feldspar..... long tons	34,741	220,422
Graphite..... lbs.	3,967,612	167,714
Fluorspar..... short tons	19,586	113,803
Chrome iron ore..... long tons	368	5,790
Cobalt oxide..... lbs.	13,360	24,048
Rutile..... "	44,275	5,710
Asbestos..... short tons	747	13,498
Brick-clay.....	.....	13,800,000
Other clays..... long tons	.....	2,591,332
Grindstones.....	.....	580,703
Fibrous talc..... short tons	69,200	483,600
Soapstones..... " "	28,643	424,800
Oilstones.....	.....	158,300
Monazite..... lbs.	748,736	59,262
Bauxite ..... long tons	18,905	79,914
Sulphur..... short "	7,690	223,430
Fuller's earth..... " "	10,967	80,697
Infusorial earth..... " "	4,020	52,959
Millstones.....	.....	57,170
Magnesite..... short tons	13,172	43,050
Garnet (abrasive).....	4,444	158,107
Total.....	.....	$566,351,096
SUMMARY.		
Metallic products.....	.....	$524,873,284
Non-metallic products.....	.....	566,361,096
Mineral products unspecified.....	.....	1,000,000
Grand total.....	.....	$1,092,224,380

The following, among the products of 1880, are useful for comparison:

Products.	Quantity.	Value.
Iron..... short tons.	7,064,829	$20,470,756
Silver, coining value..... troy oz.	31,797,474	41,110,957
Gold, " " ..... " "	1,614,741	33,379,663
Copper, value New York..... ...lbs.	55,825,024	8,886,295
Lead..... ..... short tons.	53,140	2,102,948
Zinc..... ..... " "	123,868	2,079,737
Bituminous coal..... " "	41,860,055	52,427,868
Anthracite coal..... " "	28,621,371	42,139,740
Building-stone..... cubic ft.	110,807,463	11,809,522
Lime..... barrels.	26,048,000	24,615,360
Salt..... ..... "	6,169,979	5,191,222
Minor minerals.....	.....	3,387,444

Agriculture.—The production of the chief cereals from 1860 to 1902 is a vivid illustration of the growth of this basic industry.

	Bu. 1850.	Bu. 1860.	Bu. 1870.	Bu. 1880.	Bu. 1890.
Corn	592,071,104	838,792,742	760,944,549	1,754,591,696	1,489,970,000
Wheat.....	100,485,944	173,104,924	287,745,626	459,483,137	399,262,000
Oats.....	146,584,179	172,643,185	282,107,157	407,858,999	523,621,000

The following table shows the acreage, production, and value of the principal farm crops in the cal. year 1902:

Crop.	Acreage.	Yield.	Value.
Corn	94,043,613	2,523,648,312 bu.	$1,107,017,349
Cotton	24,275,101		
Wheat	46,202,424	670,063,008 "	422,224,117
Oats	28,653,144	987,842,712 "	303,584,852
Rye	1,978,548	33,630,592 "	17,080,793
Barley	4,661,063	134,954,023 "	61,898,634
Buckwheat	804,889	14,529,770 "	8,654,704
Potatoes	2,965,587	284,632,787 "	134,111,435
Tobacco	1,030,734	821,823,963 lbs.	80,472,506
Hay	39,825,227	59,857,576 tons	542,036,364
Total	244,440,250		$2,677,080,755

The number of animals reported on the farms and ranches 1902, Jan. 1, was as follows:

Animals.	Number.	Value.
Horses	16,557,373	$1,030,705,959
Mules	2,728,088	197,753,327
Milch Cows	17,105,227	516,711,914
Oxen and other cattle	44,659,205	824,054,902
Sheep	63,964,876	168,315,750
Swine	46,922,624	364,973,688
Total	191,937,394	$3,002,515,546

In 1890 the farmer furnished 74·2 per cent. of the total shipments abroad, the agricultural exports amounting to $627,216,656; and in the fiscal year ending 1896, June 30, he furnished 66·02 per cent., the exports of products of agriculture aggregating in value $569,841,714.

The U. S. government, through the dept. of agriculture maintains (1903) a weather service bureau, publishes a large list of regular and special bulletins on every branch of the industry, and liberally promotes agricultural education in the states and territories.

By the aid of grants of public lands to the states and territories under act of congress 1862, July 2, 65 schools of science have been established in the U. S., known usually as agricultural and mechanical colleges (see EDUCATION, NATIONAL OR STATE: AGRICULTURAL EDUCATION). To facilitate the work and to encourage original investigation, experiment stations have been established as departments of these colleges in nearly all the states and territories under act of congress 1887, Mar. 2, which provided for an appropriation out of the proceeds of sales of public lands of $15,000 to each state and territory having such colleges and stations, for the year 1890, for an annual increase of $1,000 thereafter for 10 years, and for a subsequent annual appropriation of $25,000 to each state and territory.

Manufactures.—The following table gives a comparison of the manufacturing industries in 1880 and 1890; and details of the principal ones, arranged in the order of the value of output, in 1900, according to the revised census

returns. In 1890 the total capital employed in manufacturing was $6,139,397,785; in 1900.

Principal Industries.	Estab	Hands employed.	Wages Paid.	Cost of materials.	Value of products.
			$	$	$
All industries 1900	512734	5321,389	2,330.578,000	7,360,993,418	13039279,566
All industries 1890	355401	4711,832	2,282,823,265	5,158,868,353	9,370,107,624
Increase	157319	1069,776	439,350,689	2,198,949,342	3,666,842,283
Slaughtering and meat-packing (wholesale).	410	57,791	28,074,511	536,460,070	617,890,435
Foundry and machine shops....	5,349	245,677	130,809,016	203,071,577	456,293,558
Iron and steel....	263	115,237	64,284,616	265,254.464	412,819,287
Printing and publishing.....	9,160	120,189	69,617,637	74,099,117	288,130,414
Clothing, men's, factories.	5,354	109,878	42,810,493	138,400,353	264,275,366
Liquors, malt....	790	32,968	21,999,685	43,785,988	205,602,774
Cotton goods.....	365	143,438	47,619 048	86,401,533	173,088,338
Flour.....	669	9,337	5,208,171	152,584,164	172,921,945
Clothing, women's factories.	2,574	77,587	31,022,643	81.003,783	152,780,290
Boots and shoes..	992	84,835	35,541,670	95,259.912	151,813,904
Cigars	8,477	71,814	28,923,535	40.650,949	114.724,412
Leather	395	27,319	12.390,306	72,739,535	98,060.979
Lumber, plaining mill products...	1,362	40,976	19,642,319	53,681.010	93,102,326
Worsted goods...	103	42,204	14,610,572	54,933,941	86,810,195
Furniture factories.....	1,133	56,355	24,775,307	37,381,177	86,222,242
Carriages and wagons.	2,424	35,791	18,003,708	31,596,716	68,924,998
Silk and silk goods.....	303	39,815	13,856,274	37,744.300	66,329,878
Coffee and spices.	422	5,811	2,397,174	52,310,340	66,263,974
Electrical apparatus, supplies.	477	30,068	14,581,321	34,317,143	66,176,755
Liquors, distilled.	55	1,065	602,681	7,345,955	63,496,208
Cars, steam and railroad..	37	22,227	11,850,277	40,091,880	60,127,644

In the fiscal year ending 1902, June 30, the collections of internal revenue on taxable manufactures were: Distilled spirits, $121,138,013; tobacco, $51,937,925; fermented liquors, $71,988,902; oleomargarine, $2,944,493; playing cards, $364.678; miscellaneous and penalties, $942,853—total, $249,316,814. The same sources yielded an aggregate of $249,316,813 in the year ending 1901, June 30. In 1901, Dec. 31, there were reported 24,567 single-account cigar factories, which used 116,388,262 pounds of tobacco, and had an output of 6,914,639,-012 cigars. The cigarette factories numbered 364;

used 11,079,704 lbs. of tobacco and had an output of 2,728,153,697 cigarettes; 2,484 other tobacco factories used 240,405,931 lbs. of leaf, 22,711,137 lbs. of scrap, 7,454.612 lbs. of stems, 36,827,481 lbs. of licorice, 26,-769,227 lbs. of sugar, and 26,361,726 lbs. of other materials, and which had an output of 172,498,732 lbs. of plug tobacco, 11,722.314 lbs. of fine cut, 112,156,974 lbs. of smoking, and 17,513,317 lbs. of snuff. There were in operation 1,089 grain, 11 molasses, and 1,838 fruit distilleries; and in the year ending 1902, June 30, the production was 126,421,333 gals. of spirits; 2,202,047 gals. of rum; 4,220,400 gals. of fruit brandy; and 44,-478,822 bbls. of fermented liquors. The production of oleomargarine was 126,316,427 lbs.—For further and later details and special manufactures and industries. see under the titles of the various states, territories and cities.

Commerce.—During the year ending 1902, June 30, the total value of imports of merchandise into the U. S. was $903,320,948; value of domestic exports, $1,355,481,-861; foreign exports, $26,237,540—total trade $2,285,-040,349; imports of gold and silver coin and bullion, $80,253,508; exports, $98,301,340—total trade, $178,554,-848; grand total trade, $2,463,595,197. Value of imports from United Kingdom was $165,746,560; from Germany, $101,150,601. Of domestic exports 1902, $542,001,128 or 39.7 per cent. went to Great Britain and colonies. Exports of domestic manufactures were more than $40,-000.000 greater than in any other year in our history. Following is a classification of the imports and exports of merchandise for the year ending 1903, June 30:

Groups.	Value.	Per cent.
IMPORTS.		
Free of duty:		
Articles of food and live animals	89,779.088	21·07
Crude articles for domestic industry	267,398,914	62·74
Articles manufactured—		
For mechanic arts	40,905,326	9·60
For consumption	14,372,996	3·37
Articles of voluntary use, luxuries, etc	13,725,642	3·22
Total free of duty	426,181,966	100
Dutiable:		
Articles of food and live animals	128.540,677	21·44
Crude articles, etc	107,752,033	17·97
Articles manufactured—		
For mechanic arts	73.514,394	12·24
For consumption	156,016.109	27·02
Articles of voluntary use, etc	133,845,359	22·33
Total dutiable	599,569,572	100
Free and dutiable:		
Articles f food, etc	218,319,765	21·28
Crude articles, etc	375,150,947	36·58
Articles manufactured—		
For mechanic arts	114.320,720	11·15
For consumption	170,389,105	16·61
Articles of voluntary use, etc	147.571,001	14·38
Total imports of merchandise	1,025,751,538	100
Duties collected	233,891,719	

Groups.	Value.	Per Cent.
EXPORTS.		
Domestic:		
Products of agriculture	$873,285,142	62·72
Manufactures	408,187,207	29·32
Mining	38,844,759	2·79
Forest	57,830,778	4·15
Fisheries	7,755,232	·56
Miscellaneous	6,328,519	·46
Total	1,392,231.637	100
Foreign:		
Free of duty	14,920,301	53 59
Dutiable	12,986,076	46·60
Total	27,906.377	100

During the year the entrances at the various ports aggregated, sailing tonnage 3,880,153, and steam 27,234,358; and the clearances, sailing tonnage 3,827,622, and steam 27,480,948.—For fuller details, see IMPORTS: EXPORTS: SHIPPING, ETC.: also under the titles of the various states, territories, and cities.

Railroads.—There are two authorities on railroad statistics in the U. S.—the Interstate Commerce Commission, which reports for fiscal years, and *Poor's Manual of Railroads*, which reports for calendar years, and there is necessarily a slight difference in their summaries. The total length of main track from the last report of the former was 197,237 m.; and the latter reported 1902, Jan. 1, length of 195,887. Under the last date the details were: Liabilities: Capital stock, $5,978,796,249; bonded debt, $6.035.469,741; unfunded debt, $312,225,536; and current debt, $600,468,995—total, $12,926,960,521. Assets: cost of roads and equipments, $10,717,852,155; real estate, stocks, bonds, and other investments, $1,976,548,412; other assets, $390,112,441; and current account, $223,616,024—total, $13,308,029,032; excess of assets over liabilities, $381,068,511. The total gross earnings of the year were $1,612,448,826; net earnings were $520,294,727; receipts from other sources, $68,368,814; and total available revenue, $588,541. The rolling stock comprises 39,729 locomotive engines; 27,144 passenger cars; 8,667 baggage and mail cars; and 1,409,283 freight cars. Interest payments on bonds aggregated $215,191,176, and dividends paid on stocks, $24,724,348. During the year 600,485.790 passengers were carried and 1,084,066,451 tons of freight hauled; receipts from passenger traffic, $360,702,686, from freight traffic, $1,126,267,652.

The U. S. has more than one-half of the estimated railroad mileage of the world, and of the states and territories, Ill. ranked first with 11,238 m. of main track; Tex. second, 10,566; Penn. third, 10,394; Ia. fourth, 9,451; O. fifth, 9,011; Kan. sixth, 8,744; and N. Y. seventh, 8,115; all others had less than 8,000 m. each. The above 7 states had more than 35 per cent. of the total of the country, they contained less than 20 per cent. of the total

area, excluding Alaska, and nearly 40 per cent. of the total-population. During 1894 the new mileage amounted to 1,919.13 m., and 1901 to 3,891 m. net. In the foregoing the mileage is considered as showing the single-track length. If subsidiary tracks, as double and sidings, were included there would be a total exceeding 250,000 m.—For further and later details see RAILROADS; also under the titles of the states and territories.

Telegraph and Telephone.—In the period 1880-1902 the length of telegraph lines in the U. S. increased from 85,-645 m. to 196,115; the length of wire from 233,534 m. to 1,029,984; the number of offices from 9,077 to 23,567, number of messages from 29,215,509 to 69,374,883, receipts from $12,782,895 to $28,073,095, expenses from $6,335,415 to $20,780,766; and profits from $3,229,158 to $7,292,329. The greater part of the telegraph system is owned or controlled by the Western Union Tel. Co. Other corporations operate about 40,000 m. of line. Excluding railroad, govt., private, and telephonic lines, there was (1902) an aggregate of over 250,000 m. of line open for public business.—The telephone service is practically conducted by the American Bell Telephone Co., which 1902 had capital $104,650,600; exchange 1,411; branch offices 1,594; wire on poles 823,193 m.; wire on buildings 17,947 m.; wire underground 883,679 m.; wire submarine 4,200, total length of wire 1,729,019 m.; circuits 592,467; employees 40,864; subscribers 1,020,647; and instruments under rental 2,525,606. The gross earnings during 1901 were $11,606,817; net earnings $7,398,286; receipts from rent of instruments $2,647,910; and dividends paid stockholders $5,050,024. See TELEGRAPH: TELEPHONE.

Religion.—There is no religion established by law in the U. S. or in any of the several states. Profession and practice of any and all religions are entirely free, so long as they do not disturb public order or infringe those social moralities or decencies which are regarded as essential in modern civilization. Christianity is held accountable to the same judgment as any other religious system. Nevertheless, the fact is undeniable that the nation is a Christian nation, not pagan, not Mohammedan, not atheistic. Christianity, though not established by law, is, and has been from the beginning, recognized in the national and state laws as an existing fact which by its very nature carried a stupendous moral force. The religion of the people who colonized North America could not but give shape and guidance to the constitutions of government which the people formed. The colonies of Christian folk founded here a nation which statistics show to be more generally Christian than it was a hundred years ago.

But it is only an extremely simple, broad, essential Christian religion that holds such legal recognition. Abhorrent to the whole spirit of our laws and of our people would be any rigid, narrow, sectarian, exclusive administration of the religious principle such as an established church would involve. The state is in no sense propagating or supporting Christianity; instead it is simply

recognizing and using the great common Christianity as one of the grand supporting forces of the state, as seen in the general opening of legislative sessions, and in some states of judicial terms, with prayer; also in the appointment of chaplains in the army and navy and in penal institutions. Turning from the national or state religion—which the foregoing sentences merely state as a *fact* without reference to its desirableness or undesirableness—we look at the expression of Christianity which is made by the people in their individual capacity in the organizing and support of churches. Here we find an immense variety of denominations, whose clashing tenets have evidently been much softened during a single generation by the touch of Christian charity. By nearly all the leading sects from their beginning education has been earnestly fostered, especially in its higher lines. SEE RELIGION: also the various denominations: SUNDAY SCHOOLS: MISSIONS, CHRISTIAN: CHRISTIAN ENDEAVOR, SOCIETY OF: BIBLE SOCIETY.

Denominations (1902).	Ministers.	Churches	Members.
Adventists, 6 bodies	1,554	2,402	96,487
Baptists, 13 bodies	35,564	51,142	4,629,487
Brethren (River), 3 bodies	151	108	3,605
Brethren (Plymouth), 4 bodies	.....	314	6,661
Catholics, 8 bodies	12,779	11,070	9,531,303
Catholic Apostalic	95	10	1,491
Chinise Temples	.....	47	.....
Christadelphians	.....	63	1,277
Christaians, 2 bodies	1,206	1,567	137,207
Christian Missionary Association	10	13	754
Christian Scientists	1,016	508	51,608
Church of God	460	580	38,000
Church of New Jerusalem	149	157	7,892
Communistic Societies, 7 bodies	.....	22	3,084
Congregationalists	5,829	5,856	659,324
Disciples of Christ	6,477	10,957	1,207,377
Dunkards, 4 bodies	3,050	1,071	106,194
Evangelical, 2 bodies	1,421	2,479	162,031
Friends, 4 bodies	1,354	1,093	118,306
Friends of the Temple	4	4	340
German Evangelical Protestant	100	155	20,000
German Evangelical Synod	940	1,179	209,159
Jews, 2 bodies	301	570	143,000
Latter-Day Saints, 2 bodies	1,500	1,310	340,500
Lutherans, 22 bodies	7,015	11,785	1,745,588
Waldenstromians	274	291	32,100
Mennonites, 12 bodies	1,112	673	59,274
Methodists, 17 bodies	39,220	56,787	6,074,755
Moravians	126	106	15,505
Presbyterians, 12 bodies	12,207	15,315	1,635,016
Protestant Episcopal, 2 bodies	5,071	6,725	767,334
Reformed, 3 bodies	1,906	2,474	385,038
Salvationists	2,510	615	22,534
Schwenkfeldians	3	4	306
Social Brethern	17	20	913
Society for Ethical Culture	.....	4	1,500
Spiritualists	.....	334	45,030
Theosophical Society	.....	71	1,629
United Brethren, 2 bodies	2,348	4,855	277,352
Unitarians	510	452	71,000
Universalists	750	772	52,944
Independent congregations	51	156	14,126
Total	147,113	194,116	28,689,028

Education.—In 1880 there were in the U. S. 203,650 elementary public schools, 5,430 high schools, and 16,800 separate schools of both kinds for colored children—total schools 225,880, and 164,832 public-school buildings, with aggregate seating capacity 8,968,731. There were enrolled in these schools 4,687,530 white male, 4,402,718 white female, 453,329 colored male, and 422,583 colored female pupils—total 9,946,160, of whom 5,715,914 whites and 560,484 colored (6,276,398) were in average daily attendance. Of teachers there were 96,099 white male, 124,086 white female, 10,520 colored male, and 5,314 colored female—total 236,019. The total value of public-school property was $211,411,540; receipts were $96,857,534, and expenditures (including $55,745,029 for teachers' salaries) $79,339,814.

In the school year 1900-1 (the last whose complete reports were available at the time of writing) the number of children 5 to 18 years old in U. S. was estimated at 21,897,678; the number enrolled in the public schools of all ages was 15,603,451; and the number in average daily attendance was 10,692,091. Of teachers there were 123,941 male and 306,063 female—total 430,004, and of school houses 249,969. The estimated value of all public school property was 576,963,089. The receipts were: from permanent funds and rents $9,823,482, state taxes $38,476,250, local taxes $161,245,764—total from all sources $234,967,919; and the expenditures for sites, buildings, furniture, libraries, and apparatus $40,361,964, salaries of superintendents and teachers $142,776,168, miscellaneous $42,905,104—total $226,043,236. Of public high schools there were 6,318, with 21,778 teachers and 541,730 students. There were 170 public normal schools with 2,954 teachers, 73,850 students, and 8,753 graduates. The attendance at private and parochial schools was estimated at 1,588,836 (of whom about 800,000 were in Rom. Cath. and 250,000 in Ger. Luth. parochial schools) making a total of 17,299,230 children in public, private and parochial schools.

For secondary instruction there were 8,210 schools and 736,000 pupils. For the higher education of women there were reported 132 institutions with 2,392 teachers, 24,352 students, and 2,137 graduates, 488,083 volumes in the libraries, $1,577,106 value of libraries and scientific apparatus, $15,834,077 in grounds and buildings; $6,124,430 in productive funds, $3,685,322 in total income, and $17,299,230 in benefactions.

Of colleges of liberal arts there were 473, which have 14,905 professors and instructors, 169,036 students, of whom 73,847 were in courses leading to degrees A.B., B.S., etc., 8,478,624 vols. in libraries, $17,482,924 value of libraries and scientific apparatus, $146,168,475 in grounds and buildings, $157,006,070 in productive funds, $22,789,054 in total income, $17,023,202 in benefactions.

There were 42 schools of technology (23 of which were colleges of agriculture and mechanic arts endowed by acts of congress July 2, 1862, and Aug. 20, 1890), with 1,399 professors and instructors, 16,588 students, 602,763

volumes in the libraries, $4,613,352 value of libraries and scientific apparatus, $16,631,105 in grounds and buildings, $13,997,463 in productive funds, $6,785,236 in total income, and $82,000 in benefactions.

Professional instruction was provided as follows: *theology*: 150 schools, 988 professors and instructors, 7,567 students, 1,531,038 volumes in the libraries, $15,217,164 in grounds and buildings, $946,473 in benefactions; *law*: 100 schools, 1,106 professors and instructors, 13,642 students, 338,167 volumes in the libraries; *medicine: regular:* 154, with 4,752 professors and instructors, 26,757 students, 187,207 volumes in the libraries, $14,472,635 in grounds and buildings, $2,048,182 in endowment funds, and $209,192 in benefactions; *electric:* 10, with 181 professors and instructors, 746 students, 8,000 volumes in the libraries, $213,000 in grounds and buildings: *homeopathic:* 21, with 390 instructors, 7,812 students, 50,000 volumes in the libraries, $2,252,000 in grounds and buildings, $2,048,635 in endowment funds. Other professional schools were: *dental*, 57, with 1,184 instructors, 8,308 students; *pharmaceutical*, 58, with 522 instructors, 4,429 students; *nurse training*, 448, students 11,600; and veterinary, 12, with 189 instructors, 461 students. For business and commercial education there were 407 schools, which have 2,434 instructors and 110,031 students.

For the deaf and dumb there were 118 institutions, which had 1,281 teachers, 111,343 pupils, 102,428 vols. in the libraries, $2,215,178 expenditures; for the feeble minded 20 institutions, 251 teachers, 11,149 pupils, and $2,057,415 expenditures; and for juvenile reformation, 92 institutions, 696 teachers, 22,131 pupils, and $3,673,-660 expenditures.

The steady progress of education in the whole country is shown by the percentage of total school population (age 5 to 18) enrolled which was as follows: in 1870–71, 61·45 per cent.; 1879–80, 65·50 per cent.; 1889–90, 68·61 per cent.; 1894–95, 69·85 per cent.; the variations in sections were considerable. In all the New England and Middle states, also O., Ind., Mich., Ill., Wis., Minn., and Io., there has been either an actual decrease in the percentage of school population attending school since 1870, or in the cases of Mass., N. J., Ind., and Io. a very slight increase of 1·3 per cent. in Io. and N. J., and less than 1 per cent. in the others, the New England and Middle states showing an average reduction of nearly 7 per cent. The Southern states on the other hand show very great increases, averaging about 30 per cent since 1870, and only two of them, S. C. and La. have as small a proportion of children in school as R. I. The length of the school year has been steadily increased in all Northern states except N. Y. and O. which are the same, and in all Southern states except S. C., Miss., and Tex., where it has been decreased. The total expenditures in in proportion to population for school purposes have increased in every state except Miss., but the increase has been greatest in the Northern states. See EDUCATION, NATIONAL or STATE.

National Finances.—The revenues and expenditures for the fiscal year ending June 30, 1896, were:

RECEIPTS.

Customs.—	
Fruits and nuts	$2,607,628
Rice	983,305
Sugar and molasses	29,888,322
Other articles of food and live animals	3,820,709
Articles in a crude state including ores, coal, coke, pig iron, hemp, flax, wool, etc.	4,017,952
Chemicals, drugs, etc	3,727,467
Furs	927,581
Tin plate	4,621,111
Iron or steel partly manufactured	1,135,924
Leather	874,071
Other partly manufactured products	3,577,753
Cotton, manufactures of	9,004,234
Earthen, stone, and china ware	3,563,436
Flax, hemp, etc., manufactures of	5,871,666
Glass and Glassware	2 875,827
Cutlery	1,046,954
Machinery	973,061
Other manufactures of iron and steel	1,057,962
Metals and composition other than iron	1,344,729
Leather, manufactures of	2,501,169
Carpets	805,580
Woolen cloths	9,646,354
Dress goods	9,620,517
Knit fabrics	1,172,744
Other manufactures of wool	1,282,633
Other manufactured articles	4,701,560
Cotton laces, embroideries, and edgings	5,472,798
Fancy articles, toys, perfumery, etc	2,061,373
Firecrackers	183,679
Flax and hemp lace edgings, etc	499,180
Jewelry and precious stones	1,215,015
Malt liquors	648,406
Distilled spirits	2,624,785
Wines	3,462,872
Musical instruments	328,640
Silk, manufactures of	12,126,438
Tobacco and manufacture of	14,859,117
Other miscellaneous manufactures	982,647
Additional and discriminating duties	908,907
Tonnage tax	560,068
Miscellaneous	2,448,178
Total customs revenue	$160,021,752
Internal Revenue.—	
Spirits	$75,327,898
Tobacco	30,711,629
Fermented liquors	33,139,141
Other internal revenue taxes	7,584,197
Postal Revenue	82,499,208
Miscellaneous	20,191,583
Total Receipts	$409,475,408

EXPENDITURES.

Civil establishment	$85,139,591
War department and rivers and harbors	52,947,075
Navy department including new vessels, etc	27,554,733
Pensions	139,434,001
Postal service	94,218,225
Interest on public debt	35,385,029
Total expenditures	$434,678,654
Deficit	25,203,246

See DEBT, NATIONAL: IMPORTS AND EXPORTS.

Banks.—Banking in the U. S. is conducted by national banks, organized under a national banking act of congress, and reporting to the U. S. comptroller of the currency;

circulating banks, incorporated under laws of the states and territories, reporting to the state and territorial authorities, and usually denominated 'state banks;' savings banks, both mutual and stock, deriving their functions from state and territorial legislatures; loan and trust companies, operating under state and territorial charters, and private concerns and individuals. In some states the savings banks, whether mutual or stock, are classified with the state banks. Neither the U. S. govt., any state or territorial govt., nor any town, city, village, or other political subdivision, can be interested as a stockholder in any banking concern; and national and state laws governing the management of banks and their investments are very strict, and, usually, closely enforced. The following summarizes the various banking institutions of the country, under dates of their last available reports:

National Banks.—Number of banks in operation 4,601, combined capital stock $705,535,417, loans and discounts $3,280,127,480; U. S. bonds to secure circulation $324,253,760; total resources $6,113,928,912, of which $104,051,295 was gold coin, $84,248,770 gold treasury certificates, $82,137,000 gold clearing house certificates, and $50,747,624 silver treasury certificates; national bank notes outstanding $317,991,809; individual deposits $3,209,273,893; U. S. deposits $117,097,769; surplus fund $326,393,953; undivided profits $169,216,512; due to other national banks $648,885,530; to state banks and bankers $285,221,529; to trust companies and savings banks $235,220,608. The leading states in the number of banks were: Penn. (652); N. Y. (530); O. (439); Tex. (433); Ill. (382); Mass. (297).

State Banks.—Banks of circulation, 652; combined cap. $276,991,398; deposits $1,698,185,287; resources $2,309,358,715; surplus and undivided profits $163,015,358.

Loan and Trust Companies: 1901-2.—Number of companies 417; combined capital $179,732,581; deposits, $1,525,887,493; resources $1,983,214,707; surplus and profits $225,524,514.

Savings Banks: 1901-2.—Number of banks 1036; savings deposits $2,650,104,486; number of savings deposits $6,388,793; average deposits $414.85; total resources $2,893,172,986, of which $994,639,330 was loaned on real estate, and $49,580,215 on other securities, $58,140,124 invested in U. S. bonds, $481,568,530 in state, county and municipal bonds, $375,623,513 in railroad stocks and bonds, and $34,520,802 in bank stocks, in other stocks, bonds, and securities $411,631,200.

Private Banks: 1901-2.—Number of banks 1,039; combined cap. $24,263,614; deposits $131,669,948; resources $169,364,435; surplus and undivided profits $7,053,600.

During the year ending 1895, Sep. 30, the exchanges at 78 U. S. clearing-houses amounted to $51,111,591,928, an increase of $6,083,095,182 over those of the previous corresponding year. During the year ending 1902, Sep. 30, the exchanges at 97 clearing-houses amounted to $116,021,618,003, a net increase of $1,201,825,917 over those of the previous corresponding year. New York

led with $74,753,189,436, Boston coming next.—For further and later details, see under titles of the various states, territories, and cities; also BANKS IN THE UNITED STATES: BUILDING AND LOAN ASSOCIATION: CURRENCY: DEBT: FINANCE: MONEY: ETC.

Insurance.—Life: 1902, Jan. 1, there were 80 regular level premium companies in the U. S., which reported total assets $1,910,784,985; premium receipts $366,273,-457; total income $457,965,754; total expenditures, $302,-809,506; new policies issued 5,021,684; amount $2,194,-182,667; policies in force 16,030,724, amount $9,593,846,-948. *Fire:* 1902, Jan. 1: stock cos. 303, mutual 179, combined cap. $69,930,423; assets exclu. of premium notes $450,566,078; net surplus $162,083,426; cash income, $216,452,381; losses paid during year $112,007,219; dividends paid $16,333,011; total disbursements $199,096,-719; risks written in year, estimated $25,000,000,000. *Assessment and Fraternal:* 1902, Jan. 1, companies 127; assets $39,011,098; assessments collected $52,515,256; total income $54,762,061; payments to policy holders $45,481,523; total expenditures, $48,811,4796; members, 2,987,853; amount of insurance $4,612,865,856.—For fuller and later details, see INSURANCE: also under titles of the various states and of the fraternal organizations.

History.—The territories now occupied by the U. S., though they were probably visited on their n.e. coast by Norse navigators about the year 1,000, continued the sole possession of numerous tribes of Indians until the discovery of America by Columbus 1492. The coast from Labrador to Va. was explored by Sebastian Cabot 1498; Juan Ponce de Leon landed near St. Augustine, Fla., 1513, and explored a portion of that region. Some Spanish vessels from St. Domingo were driven upon the coast of Carolina 1520. By the conquests of Cortes and his followers, Mexico, including Texas, N. Mex., and Cal., became a province of Spain 1521. Ferdinand de Soto led a Spanish expedition from Fla. across Ala., and discovered the Mississippi river. Sir Walter Raleigh sent two expeditions 1584–5 to the coast of N. C., and attempted to form settlements on Roanoke Island. A Spanish settlement was made at St. Augustine, Fla., 1565. Jamestown, Va., was settled 1607; N. Y., then called the New Netherlands, by the Dutch 1613; Plymouth, Mass., by the Eng. Pilgrims (see PILGRIM FATHERS) 1620. A large part of the country on the great lakes and on the Mississippi was explored by La Salle 1682; and settlements were made by the French at Kaskaskia, Ill., and Arkansas Post, 1685; Mobile, Ala., and Vincennes, Ind., 1702: for the early history of the various colonies which now constitute the U. S., see the different states and territories. The first effort at a union of colonies was in 1643, when the settlements in Mass., N. H., R. I., and Conn. formed a confederacy for mutual defense against the French, Dutch, and Indians, under the title 'The United Colonies of New England.' They experienced the benefits of united action in 1754, when an English grant of lands to the Ohio Company brought on the French and Indian war—the French claiming, at that period, as the first explorers, northern New England, half

of N. Y., and the entire Mississippi valley. George Washington was sent on his first expedition to remonstrate with the French authorities; and, the colonies being advised to unite for general defense, a plan for a general government of all the English colonies was drawn up by Benjamin Franklin; but it was rejected by both the colonies and the crown—by the colonies in their wish to preserve their separate independence, and by the crown from jealousy of their united strength. The colonists, however, took active part in the war. Under Major Washington, they joined Gen. Braddock in his unfortunate expedition against Fort Du Quesne, now Pittsburgh; they aided in the reduction of Louisburg, Ticonderoga, Crown Point, and Niagara; and rejoiced in the conquest of Quebec, by which the vast n. regions of America became the possessions of Great Britain: see FRENCH WAR (or OLD FRENCH WAR) IN NORTH AMERICA. (Also, for the earlier history, see titles of the respective explorers, places, and battles mentioned above.)

The principles of a representative government were brought to America by the earliest colonists. The colonies themselves were founded by private adventure, with very little aid from government. The Plymouth colony was for 18 years a strict democracy, and afterward a republic under a charter from the crown. It was not till the Protectorate and the reign of Charles II. that the colonies were considered as portions of the empire, to be governed by parliament, when navigation acts were passed to give English ships a monopoly of commerce, when the produce of the colonies was required to be sent to England, and duties were levied on commodities sent from one colony to another. Protests were made against these assumptions; Virginia asserted her right of self-government; and it was not until the English revolution of 1688 that settled and uniform relations were established between England and the colonies.

In 1713, by the treaty of Utrecht (see UTRECHT, PEACE OF), England, which, since the reign of Elizabeth, had imported slaves from Africa into her American and W. Indian colonies, obtained a monopoly of the slave-trade, engaging to furnish Spanish America, in 33 years, with 144,000 negroes. A great slave-trading company was formed in England, one-quarter of the stock being taken by Queen Anne, and one-quarter by the king of Spain, these two sovereigns becoming the greatest slave-dealers in Christendom. By this monopoly, slavery was extended in, and to some extent forced upon, all the Amer. colonies.

At this period there was a general feeling of loyalty toward the mother country. The sons of the more wealthy colonists, especially in the south, were educated in England; English literature pervaded the colonies; the British throne was the fountain of honor; the colonies, though distinct, and differing in origin and character—Puritan in in the east, Dutch Reformed in N. Y., Quaker in Penn., Rom. Cath. in Md., and Church of England in Va.—were yet united by language, common ties, fears, and interests.

In 1761 the enforcement of the navigation act against illegal traders, by general search-warrants, caused strong excitement against the govt., especially in Boston. The admiralty enforced the law; many vessels were seized; and the colonial trade with the W. Indies was annihilated. In 1765 the passing of an act of parliament for collecting a colonial revenue by stamps caused general indignation and led to riots. Patrick Henry, in the Va. assembly, denied the right of parliament to tax America, and eloquently asserted the dogma 'no taxation without representation.' The first impulse was to unite against a common danger; and the first colonial congress, of 28 delegates, representing 9 colonies, made a statement of grievances and a declaration of rights. The stamps were destroyed or reshipped to England, and popular societies were formed in the chief towns, called 'Sons of Liberty.' In 1766 the Stamp Act was repealed, to the general joy of the colonists; but the principle of colonial taxation was not abandoned; and, 1767, duties were levied on glass, paper, printers' colors, and tea. This renewed attempt produced, 1768, riot in Boston, and Gov. Gage was furnished with a military force of 700 to preserve order and enforce the laws. In 1773 the duties were repealed, excepting 3*d.* a pound on tea. It was now a question of principle, and from north to south it was determined that this tax should not be paid. Some cargoes were stored in damp warehouses and spoiled; some sent back; in Boston, a mob, disguised as Indians, threw a cargo of tea into the harbor. To punish this outrage, parliament passed the Boston Port Bill, 1774, by which the chief town of New England was no longer a port of entry, and its trade transferred to Salem.

A fleet comprising several ships of the line, with 10,000 troops, was sent to America; while the colonists, though still asserting their loyalty, prepared to resist the unconstitutional assumptions of the govt. against the rights of British subjects. Volunteers were drilling in every direction, and depots of provisions and military stores were being gathered. A small force being sent from Boston to seize one of these depots at Concord, Mass., led to the battle of Lexington, the beginning of the war of the revolution, 1775, Apr. 19. [See—here and throughout this historical sketch—the respective titles of principal persons, places, and battles mentioned.] The British troops were attacked on their return, and compelled to a hasty retreat. The news of this event summoned 20,000 men to the vicinity of Boston. The royal forts and arsenals of the colonies were seized, with their arms and munitions. Crown Point and Ticonderoga, the principal northern fortifications, were surprised, and their artillery and stores appropriated. A congress of the colonies assembled at Philadelphia, which resolved to raise and equip an army of 20,000 men, and appointed George Washington commander in-chief. Bunker Hill, in Charlestown, near Boston, where 1,500 Americans had hastily intrenched themselves, was taken by assault by the British troops 1775, June 17, but with so heavy a loss (1,054) that the defeat had for the provincials the moral effect

of a victory. After a winter of great privations, the British evacuated Boston, carrying away in their fleet to Halifax 1,500 loyal families of refugees.

The British govt. now put forth a strong effort to reduce the colonies to submission. An army of 55,000, including 17,000 German mercenaries ('Hessians'), was sent, under the command of Sir William Howe, to put down this 'wicked rebellion.' The provincial congress, declaring that the royal authority had ceased, recommended to the several colonies to adopt 'such governments as might best conduce to the safety and happiness of the people;' and the 13 colonies soon adopted constitutions as independent states. 1776, June 7, Richard Henry Lee, of Va., offered a resolution in congress, declaring that 'the united colonies are, and ought to be, free and independent states; that they are absolved from all allegiance to the British crown; and that all political connection between them and the state of Great Britain is, and ought to be, totally dissolved.' This resolution, after earnest debate, was adopted by the votes of 9 out of 13 colonies. A committee, consisting of Thomas Jefferson, John Adams, Benjamin Franklin, Roger Sherman, and Robert R. Livingston, was instructed to prepare a declaration in accordance with the above resolution; and the celebrated Declaration of Independence, written by Jefferson, based on the equality of men and the universal right of self-government, and asserting that 'all government derives its just powers from the consent of the governed,' received (1776, July 4) the assent of the delegates of the colonies, which thus dissolved their allegiance to the British crown, and declared themselves free and independent states, under the general title of the United States of America—New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia—occupying a narrow line of the Atlantic coast between Canada and Florida, e. of the Alleghanies, with pop. about 2,500,000.

After the evacuation of Boston, Gen. Washington, with the remains of his army, thinned by the hardships of winter, hastened to New York. Gen. Howe, being joined by his brother, Admiral Lord Howe, and Sir Henry Clinton, found himself (July 2) at the head of 35,000 men; defeated the Americans on Long Island 1776, Aug. 27; compelled the evacuation of New York, and secured possession of its spacious harbor and the Hudson river. Gen. Washington, with inferior and undisciplined forces, retreated across N. J., closely followed by the English, hoping to save Philadelphia. Newark, New Brunswick, Princeton, were taken, and the British awaited the freezing of the Delaware to occupy Philadelphia. On Christmas night, Gen. Washington, by crossing in boats among floating ice, made a successful night-attack upon a Hessian force at Trenton, and gave new courage to the desponding Americans, who recruited the army, and harassed the enemy with a winter campaign.

In the mean time, Silas Deane and Benjamin Franklin

had been sent to France to solicit recognition and aid. The recognition was delayed, but important aid was privately given in money and supplies, and European volunteers—the Marquis de Lafayette, Baron Steuben, Baron de Kalb, Kosciusko, and Pulaski rendering the most important services. Efforts were made to induce the British colonies of Canada and Nova Scotia to unite in the struggle for independence, and an expedition was sent against Montreal and Quebec, led by Generals Montgomery and Arnold. The Canadians refused their aid; Montgomery was killed, Arnold wounded, and the remains of the expedition returned after terrible sufferings. In 1777, after several severe actions in N. J., generally disastrous to the Americans, the British took possession of Philadelphia; and Washington, with the remnants of his army, went into winter-quarters at Valley Forge, where they suffered from cold, hunger, and nakedness.

While Washington was unsuccessfully contending against disciplined and overwhelming forces in N. J., Gen. Burgoyne was leading an army of 7,000 Brit. and German troops, with a large force of Canadians and Indians, from Canada into n. N. Y., to form a junction with the British on the Hudson, and separate New England from the rest of the revolted states. His march was delayed by felled trees and destroyed roads; his foraging expeditions were defeated; and after two sharp actions at Stillwater and Saratoga, with but three days' rations left, he was compelled to capitulate, 1777, Oct. 17; and England, in the midst of victories, heard with dismay of the loss of an entire army. The Americans gained 5,000 muskets, and a large train of artillery. Feeling the need of more unity of action, articles of confederation, proposed by Franklin, 1775, were adopted 1777: these constituted a league of friendship between the states, but not a government which had any powers of coercion.

Lord Carlisle was sent to America by the Brit. govt. with offers of conciliation 1778; but it was too late. France at the same time recognized American independence, and sent a large fleet and supplies of clothing, arms, and munitions of war to their aid: and Gen. Clinton, who had superseded Gen. Howe, finding his supplies at Philadelphia threatened, retreated to New York, defeating the Americans at Monmouth.

The repeated victories of the Brit. armies, the aid afforded by great numbers of Americans who still adhered to the royal cause and furnished during the war not less than 20,000 troops, and the alliance of large tribes of Indians, who committed cruel ravages in the frontier settlements, did little toward subjugating the country. Portions of the sea-coast of New England and Va. were laid waste; but the king's troops were worn out with long marches and tedious campaigns, and even weakened by victories. Spain, and then Holland, joined France in the war against England. Paul Jones, with ships fitted out in French harbors, fought desperate battles under the American flag off the English coast. But the king and

parliament were determined to maintain the honor of the crown and the integrity of the empire. In 1780, 85,000 seamen were raised, and 35,000 additional troops sent to America, and a strong effort was made to subjugate the Carolinas, where the war became of a bitter partisan character, and was conducted with spirit by Sumter, Marion, and other southern chieftains. Lord Cornwallis, with a large army, marched from Charleston, through N. C., pursuing, and sometimes defeating the American Gen. Gates. Worn out with his success, he arrived in Va., where he was confronted by Gen. Lafayette. In the mean time, Admiral de Varney had arrived off the coast with a powerful French fleet, and 6,000 soldiers of the *élite* of the French army, under Count de Rochambeau. Cornwallis was obliged to fortify himself at Yorktown, blockaded by the fleet of Count de Grasse, and besieged by the allied army of French and Americans, waiting for Sir Henry Clinton to send him relief from New York. 1781, Oct. 19, he was compelled to surrender his army of 7,000 men—an event which produced such a change of feeling in England as to cause the resignation of the ministry, and the dispatch of Gen. Sir Guy Carleton to New York with offers of terms of peace. The preliminaries were signed at Paris, 1782, Nov. 30; and peace was concluded between England on one side, and France, Holland, and America on the other, 1783, Sep. 3. The independence of each of the several states was acknowledged, with a liberal settlement of territorial boundaries. In April, a cessation of hostilities had been proclaimed, and the Amer. army disbanded; New York, which had been held by the English through the whole war, was evacuated Nov. 25; Gen. Washington, Dec. 4, took leave of his companions in arms, and Dec. 23 resigned into the hands of congress his commission as commander.

From the retreat of Lexington, 1775, Apr. 19, to the surrender of Yorktown, 1781, Oct. 19, in 24 engagements, including the surrender of two armies, the Brit. losses in the field were not less than 25,000 men, while those of the Americans were about 8,000.

The states were free, but exhausted, with a foreign debt of $8,000,000, a domestic debt of $30,000,000, an army unpaid and discontented, a paper-currency utterly worthless, and a bankrupt treasury. The states were called on to pay their shares of the necessary expenditures; but they also were in debt, and there was no power to compel them to pay, or to raise money by taxation. In these difficulties, and in view of the failure of the articles of confederation, a convention was summoned by the congress 1787, to revise these articles. The task was so difficult that the convention resolved to propose an entirely new constitution, granting fuller powers to a federal ngress and executive, and one which should act on the people individually as well as on the states. The constitution was therefore framed, which is still the basis of the vernment; and though it was strongly opposed by many, who believed that the extensive powers granted by it to con-

gress and the executive would be dangerous to the liberties of the people, it was, 1787–8, adopted, in some cases by small majorities, in 11 state conventions, and finally by the whole 13 states, chiefly through the exertions and writings of James Madison, John Jay, and Alexander Hamilton: see CONSTITUTION OF THE UNITED STATES. Va. ratified the constitution with the declaration that she was at liberty to withdraw from the Union whenever its powers were used for oppression; and N. Y., after Hamilton had declared that no state could ever be coerced by an armed force. (For the political history of this important period, see POLITICAL PARTIES IN THE UNITED STATES: CONSTITUTIONAL CONVENTION: CONVENTIONS, NATIONAL POLITICAL.) George Washington and John Adams, standing at the head of the federalist party, which favored a strong centralized national govt., were elected pres. and vice-pres. of the U. S. under the new constitution. The pres. took the oath under the new constitution, on the site of the present sub-treasury building in Wall street, New York; and the govt. was organized with Thomas Jefferson, sec. of state; Alexander Hamilton, sec. of the treasury; Gen. Knox, sec. of war, and John Jay, chief-justice of the supreme court. Congress assumed the war debts of the several states, and chartered the Bank of the United States, though its constitutional right to do so was strenuously denied by the (then) republican or states' rights party. Washington was re-elected to the presidency 1792. The federalists took the side of England in the great European contest of that time, while the republicans sympathized with the French Revolution. There grew up also difficulties between the Eng. and Amer. governments. The Americans accused the English of carrying off large numbers of negroes and other property at the close of the war; while the English accused the Americans of sequestrating the property of loyalists, which they had engaged by treaty to restore to them. These controversies were happily settled by John Jay.

In 1796 Washington, worn and irritated by partisan conflicts and criticisms, refused a third election, and issued his farewell address to the people, warning them against the dangers of party-spirit and disunion, and of foreign alliances and entanglements, and giving them advice worthy of one who was said to be 'first in war, first in peace, and first in the hearts of his countrymen.' John Adams was elected pres.; and Thomas Jefferson, the second choice of the people for the presidency, became, according to the rule at first adopted, vice-pres. In 1798 the commercial regulations of France, and the assertion of the right to search and capture American vessels, nearly led to a war between the two republics; indeed the state of affairs has been termed 'the war with France.' The seat of govt. was removed, 1800, the year after Washington's death, to the city that he had planned for a capital, and which bears his name. John Adams, having lost popularity through his supposed partiality for England,

and for other reasons, failed of re-election; and Thomas Jefferson, the foremost man of the republican (now known as democratic) party was chosen pres. by the house of representatives, after 35 ballotings, with Aaron Burr for vice-pres. Tenn , Ky., Vt., and Ohio had now been organized as states, and admitted into the Union. In 1803, the area of the country was more than doubled by the purchase of Louisiana, which then comprised the whole region between the Mississippi and Rocky Mts., from France for $15,000,000. The infant navy waged a successful war with Tripoli. In 1805 Jefferson was elected for a second term; but Burr, having lost the confidence of his party, engaged in a conspiracy to seize the Mississippi valley, and found a new empire, with its cap. at New Orleans: he was tried for treason, but not convicted. The commerce of America was highly prosperous, her ships doing much of the carrying trade of Europe; but 1806, May, England declared a blockade from Brest to the Elbe, and Bonaparte, in Nov., decreed the blockade of the coasts of the United Kingdom. Amer. vessels were captured by both parties, and were searched by Brit. ships for Brit. subjects; and those suspected of having been born on Brit. soil, were—in accordance with the doctrine, once a subject always a subject—impressed into the naval service. Even U. S. men-of-war were not excepted from this process. The Brit. frigate *Leopard* meeting the U. S. frigate *Chesapeake*, demanded four of her men, and on refusal, fired into her, and the surprised *Chesapeake* struck her flag. Brit. ships were hereupon forbidden U. S. harbors.

Jefferson, declining a third term, was succeeded by James Madison 1809. The French decrees, prejudicial to neutral commerce, were revoked 1810; but the English decrees continued, a source of loss and irritation, while hundreds of Amer. citizens were in forced service in Brit. vessels. The feeling was increased by a night encounter between the U. S. frigate *President* and the Brit. sloop-of-war *Little Belt*, 1811, May 16. In 1812, Apr., an embargo was again declared by congress, preparatory to a declaration of war against Great Britain, July 19; for which congress voted to raise 25,000 regular soldiers, 50,000 vols., and 100,000 militia. Gen. Hull, with 2,000 men at Detroit, invaded Canada; but on being met by a small force of British and Indians, under Gen. Brock, recrossed the river, and made a shameful surrender: he was sentenced to death for his cowardice, but pardoned by the pres. A second invasion of Canada was made near Niagara Falls by Gen. Van Rensselaer. One thousand American militia stormed the heights of Queenstown, and the Brit. gen., Brock, was killed; but reinforcements arriving opportunely, the heights were retaken, and nearly all the Americans were killed or driven into the Niagara, while the Amer. gen. was in vain imploring a large body of militia on the opposite bank to cross over to the support of their brethren in arms. They refused, on the ground that the govt. had no constitutional right to send the militia beyond the frontier. The federal party, from the first opposed to

the war, defended this doctrine: and Gen. Van Rensselaer resigned in disgust. Amer. disasters on the land were, however, compensated by victories at sea. 1812, Aug. 19, the U. S. frigate *Constitution* captured the Brit. frigate *Guerrière;* Oct. 18, the U. S. vessel *Wasp* took the *Frolic;* Oct. 25, the frigate *United States* captured the *Macedonian;* Dec. 29, the *Constitution* took the *Java.* In most cases the U. S. ships were larger and their ordnance was heavier; but the immense disparity in losses showed also superior seamanship and gunnery. Amer. privateers took 300 Brit. vessels and 3,000 prisoners. Gen. Proctor, 1813, crossed the Detroit river with a considerable force of British and Indians, and defeated Gen. Winchester, with the usual barbarous results of savage warfare. In April, an Amer. army of 1,700 men captured York (now Toronto), and about the same time another Amer. force of 800 men was defeated with great loss by the Indians under Tecumseh; but the remainder of this campaign was wholly favorable to the Americans. The attempt of the Brit. gen., Prevost, on Sackett's harbor was repulsed; the squadron on Lake Erie, consisting of 6 vessels, 63 guns, was captured by Commodore Perry at the head of a U. S. flotilla of 9 vessels, 54 guns; and this success enabled Gen. Wm. H. Harrison to invade Canada, where he defeated Gen. Proctor in the battle of the Thames, in which the great Indian warrior-chief Tecumseh was killed. In 1813 another invasion of Canada was attempted; and York (now Toronto) was again taken by Gen. Dearborn; and an unsuccessful attempt was made to take Montreal. Villages were burned on both sides. The Brit. also destroyed Amer. shipping in Delaware Bay. At the same period, Gen. Jackson defeated the Creek Indians in Ala. and Ga., who had been excited to make war on the frontier settlements.

In 1814 Generals Scott and Ripley crossed the Niagara, and sharp actions, with no decisive results, were fought at Chippewa and Lundy's Lane. A Brit. invasion, by Lake Champlain, by Gen. Sir George Prevost, with 14,000 men and a flotilla on the lake, was unsuccessful: Sep. 6, the flotilla was defeated and captured in the harbor of Plattsburg, while the army was repulsed on shore, and retreated with heavy loss. In Aug. a Brit. fleet ascended Chesapeake Bay, took Washington with slight resistance, and burned the govt. buildings A subsequent attack on Baltimore was unsuccessful. New York, New London, and Boston were blockaded, and a large expedition was sent against Mobile and New Orleans. 1815, Jan. 8, Gen. Packenham advanced with 12,000 men against New Orleans, which was defended by Gen. Jackson , at the head of 6,000 militia, chiefly from Tenn. and Ky., aided by a small force of artillery, recruited from the Barataria pirates. The U. S. troops were sheltered by a breastwork of cotton bales, and the Brit. assault was met with so deadly a fire of riflemen, that it was repulsed, with the loss of Gen. Packenham and several officers, with 700 killed and 1,000 wounded; while the entire American loss appears

to have amounted to only 71. This ill-planned and unfortunate action was fought more than a month after peace had been concluded between England and the U. S., and was followed by two naval actions in Feb. and March. Though during this war fortune at first favored the Americans on the high seas, it changed completely from 1813, June. June 1, the *Chesapeake* was taken by the *Shannon;* June 3, the *Growler* and *Eagle* were captured by Brit. gunboats; the *Argus* was taken by the *Pelican*, Aug. 14; the *Essex* by the *Phœbe* and *Cherub*, 1814, March 29: the *President* by the *Endymion*, 1815, Jan. 15; the only counterbalancing success being the sinking of the Brit. sloop-of-war *Avon* by the *Wasp*, 1814, Sep. 8. In 1814, Dec., federalists of New England held a convention of 25 delegates at Hartford in opposition to the war and the administration: see HARTFORD CONVENTION. Peace between the U. S. and Great Britain was concluded by the treaty of Ghent (q.v.) 1814, Dec. 24, ratified 1815, Feb. 17.

In 1815 Commodore Decatur, who had taken a distinguished part in the recent war, commanded an expedition against the Algerians—whose corsairs had preyed on American commerce in the Mediterranean—and dictated terms to Algiers, Tunis, and Tripoli.

The democratic-republican party having brought the war to a satisfactory conclusion, the federalists disappeared; James Monroe was elected to the presidency, almost without opposition, 1817, in 'the era of good feeling.' A rapid emigration from Europe and from the Atlantic states to the richer lands of the west, had in ten years added six new states to the Union. Difficulties arose with the warlike southern Indian tribes, whose hunting-grounds had been invaded; and Gen. Jackson, sent against the Seminoles, summoned to his aid the Tenn. volunteers who had served under him against the Creeks and at New Orleans, defeated them, pursued them into Fla., took Pensacola, and banished the Spanish authorities and troops. He was, however, supported in these high-handed measures by the pres.; and Fla. was ceded by Spain to the U. S. 1819. Ala. and Me., a slave and a free state, were added to the Union 1820; and the question of the admission of Mo. arose in congress —the question of its admission with or without slavery: see MISSOURI. At the period of the revolution, slavery existed in all the states except Mass.; but it had gradually been abolished in the n. and middle states, except Del., and excluded from the new states between the Ohio and Mississippi by the terms on which the territory had been surrendered by Va. to the Union. Under the constitution, slaves were not counted in full as a represented population; but by a compromise, three-fifths of their numbers were added to the whites. The slave states were almost exclusively agricultural, with free-trade interests. The free states were encouraging manufactures by protection. The two sections had already entered on a struggle to maintain the balance of power against each other. After an excited contest, Mo. was admitted, with a compromise resolution 'that in uture no slave state should be erected n. of the parallel of

36° 30′ n. lat.—the n. boundary of Ark. In the presidential election of 1824 there were four candidates—John Quincy Adams, Andrew Jackson, Henry Clay, and William H. Crawford. There being no choice by the people, the house of representatives chose Adams; John C. Calhoun being elected vice-pres. Party and sectional feeling became stronger. Adams and Clay, who had till then acted with the party of Jefferson and Madison, were henceforth identified with what was called the national republican, and later, the whig, which finally, in union with the anti-slavery party, became the republican party. Two of the founders of the republic, John Adams and Thomas Jefferson, died 1826, July 4, the anniversary of the Declaration of Independence—an event which made a profound impression. The four years of Adams's administration, during which there were violent contests on protection for Amer. manufactures and on the powers of the federal govt. to carry out public works within the states, ended with an excited election contest, which resulted in the triumph of the democratic party, and the election of Andrew Jackson, with John C. Calhoun as vice-pres. The bold, decisive, and impetuous character of Gen. Jackson was shown in a general removal of those who held office, down to small postmasters and public servants in the lowest grades, and the appointment of his own partisans. An act for the rechartering of the U. S. Bank was met by a veto of the pres., who declared it unconstitutional and dangerous. An Indian war, called the Black Hawk War, broke out in Wisconsin 1832; but the passing of a high protective tariff act by congress caused a more serious trouble. The state of S. C. declared the act unconstitutional, and therefore null and void, threatening to withdraw from the Union if an attempt were made to collect the duties on foreign importations. The pres. prepared to execute the laws by military force; Calhoun resigned his office of vice-pres., and asserted in the senate the doctrine of state-sovereignty, including the right of secession: see NULLIFICATION OF UNITED STATES LAWS. A collision seemed imminent, when the affair was settled by a compromise bill, introduced by Henry Clay, providing for a gradual reduction of duties, until 1843, when they should not exceed 20 per cent. *ad valorem.*

The popularity of Gen. Jackson caused his re-election by an overwhelming majority against Henry Clay, leader of the bank, protective tariff, and internal improvement party; and he entered on his second term with Martin Van Buren of New York as vice-pres. The removal of the govt. deposits from the U. S. Bank in Philadelphia to certain state banks, led to the failure of the bank, and after some years, to the adoption of Van Buren's plan of an independent treasury. The Cherokee Indians in Ga., who had attained a degree of civilization, appealed to the pres. for protection against the seizure of their lands by the state; but they were told that he 'had no power to oppose the exercise of the sovereignty of any state over all who may be within its limits;' and the Indians were obliged to re-

move to the territory set apart for them w. of the Mississippi. The Seminoles resumed war in Fla. 1835; and this tribe of Indians, insignificant in numbers—being in an almost inaccessible region of forest-swamps, and under the crafty leadership of Osceola (q.v.)—kept up hostilities for years, at a cost to the U. S. of several thousands of men and $50,000,000. Martin Van Buren succeeded Gen. Jackson in the presidency 1837. His term of four years was a stormy one, from the great financial crisis of 1837, which followed a period of currency-expansion and wild speculation. All the banks suspended payment, and the great commercial cities threatened insurrection. Van Buren was firm in adhering to his principle of collecting the revenues of the govt. in specie, and separating the govt. from all connection with the banks. His firmness in acting against the strong sympathies of the n. and w. states with the Canadian insurrection of 1837-8, also damaged his popularity; and 1840, the election of Gen. William Henry Harrison, with John Tyler for vice-pres., was one of unexampled excitement, characterized by immense popular gatherings, political songs, the use of symbols, and the participation of both sexes to a degree before unknown in America. The whigs triumphed in nearly every state; Gen. Harrison was inaugurated 1841, Mar. 4, and the rush to Washington for offices was as great as the election had been exciting and remarkable. Worn down with the campaign and the office-seekers, Gen. Harrison died in a month after his inauguration, and was succeeded in office by the vice-pres., John Tyler, who, having been a democrat, was no sooner in power than he reverted to his former political principles. He vetoed a bill for establishment of a national bank and other measures of the party by which he had been elected. His cabinet resigned, except Daniel Webster, sec. of state; and others, democratic or neutral, were appointed in their place. During Tyler's administration, the n.e. boundary question, which nearly occasioned a war with England, was settled by Daniel Webster and Lord Ashburton; a difficulty, amounting almost to a rebellion, was settled in Rhode Island (q.v.); but the most important question agitated was that of the annexation of Tex. This annexation was advocated by the south, as a large addition to southern and slave territory; and, for the same reason, opposed by the whig and anti-slavery parties of the north. Besides, the independence of Tex., though acknowledged by the U. S., England, and France, had not been acknowledged by Mexico, and its annexation would be a *casus belli* with that power. The recent admissions of Io. and Fla. into the Union had kept the balance of power even between north and south, but Tex. would be an advantage to the south. But the gain of territory, and a contempt for Mexico, overcame these objections, and, 1845, Texas was formally annexed to the U. S.; and James K. Polk of Tenn. succeeded Tyler in the presidency.

Almonte, the Mexican minister at Washington, protested against the annexation of Tex., as an act of warlike

aggression, and to guard against a threatened invasion of Tex., Gen. Zachary Taylor was ordered with the U. S. troops of his milit. district to its s. frontier. The Mexicans crossed the Rio Grande, and commenced hostilities, 1845, Apr. 26. Gen. Taylor moved promptly forward, and won the victories of Palo Alto, Resaca de la Palma, Monterey, Saltillo, and finally, against great odds—20,000 to 4,759—the hard-fought battle of Buena Vista, a victory that excited great enthusiasm. In the mean time, Gen. Wool had been sent on an expedition to Chihuahua, in n. Mexico; Gen. Kearny to New Mexico; and Capt. Fremont and Commander Stockton took possession of Cal. 1847, Mar. 9, Gen. Scott landed at Vera Cruz, which he took on the 29th, after a siege and bombardment by land and water. Marching into the interior with a force of about 9,000 men he found Gen. Santa Anna intrenched on the heights of Cerro Gordo with 15,000 men. Apr. 18, every Mexican position was taken by storm, with 3,000 prisoners, 43 cannon, 5,000 stand of arms, etc. Waiting at Puebla for reinforcements until Aug., Gen. Scott advanced with 11,000 men toward Mexico city, near which Gen. Santa Anna awaited him with large forces and in strong positions. On Aug. 19 and 20 were fought the battles of Contreras and Churubusco, in which 9,000 Americans vanquished an army of over 30,000 Mexicans in strongly fortified positions. After a brief armistice, hostilities recommenced Sept. 7; and after a series of sanguinary actions, the American army, reduced to about 8,000, entered the city of Mexico; which ended the war. By the treaty of Guadalupe, the U. S. obtained the cession of N. Mex. and Upper Cal., the U. S. paying Mexico $15,000,000, and assuming the payment of the claims of American citizens against Mexico. The opposition to the annexation of Tex., and to the war and the acquisition of the newly-acquired territory, now became complicated and intensified by sectional feelings and the opposition to slavery. The northern party demanded that slavery should never be introduced into territories where it had not existed; the south claimed the right of her people to emigrate into the new territories, carrying with them their domestic institution: see FUGITIVE SLAVE LAW. During the debates in congress on the acquisition of the Mexican territories, David Wilmot of Penn. introduced an amendment, called the 'Wilmot Proviso,' providing that there should be neither slavery nor involuntary servitude in the acquired territory: this was voted down, but became a party principle. In 1849, Gen. Taylor, the 'Rough and Ready' victor of Buena Vista, became pres., with Millard Fillmore as vice-pres. The free-soil party (see POLITICAL PARTIES IN THE UNITED STATES) had nominated Martin Van Buren for pres., with Charles Francis Adams for vice-pres.; the democratic candidate being Gen. Lewis Cass. The liberty party in 1840 had cast 7,609 votes; in 1844 it had 62,300; Van Buren (1848) received 291,263, so rapid was the growth of a party soon destined to control the policy of the government. 1849, Sep. 1. Cal., rapidly peopled by the discovery of gold,

adopted a constitution which prohibited slavery. Violent struggles and debates in congress followed, with threats of southern secession, and protests against interference with slavery. The comparatively few zealous abolitionists of the north denounced the constitution for its support of slavery, and its requirement of the return of fugitive slaves to their owners. The south denounced the violation of the constitution by interference with slavery—a domestic institution of the states—the carrying off of negro slaves secretly by organized societies, and by what was termed the 'underground railway,' and the passage of personal liberty bills in several states, which defeated the Fugitive Slave Law (q v.) and the requirements and guarantees of the constitution. Henry Clay introduced a compromise into congress, admitting Cal. as a free state, and introducing a new and more stringent law for rendition of fugitive slaves: see COMPROMISE MEASURES OF 1850. Pres. Taylor, more used to the rough life of a frontier soldier than the cares of state, died 1850, July 9, and was succeeded by the vice-pres., Millard Fillmore.

The election of Franklin Pierce 1852, against Gen. Scott, was a triumph of the democratic, states'-rights, and southern party. Jefferson Davis, a senator from Mississippi, son-in-law of Gen. Taylor, and who had served under him in Mexico, was appointed sec. of war. New elements were added to the sectional controversies which agitated the country by the repeal of the Missouri Compromise, and the passage of the Kansas-Nebraska Bill of Senator Douglas, which left the people of every territory, on becoming a state, free to adopt or exclude the institution of slavery: see also DRED SCOTT CASE. The struggles of Kansas, approaching a civil war between the free-soil and pro-slavery parties in that rapidly growing territory, resulted in the exclusion of slavery. A brutal assault on Charles Sumner, senator from Mass., by a southerner, named Preston Brooks, in consequence of a violent speech on s. men and institutions, increased the excitement of both sections. The publication 1852 of Mrs. Harriet E. Beecher Stowe's *Uncle Tom's Cabin*, aroused so intense and universal interest in the slavery question that the book must be reckoned one of the factors in the developing political struggle. The formation of an anti-foreign and no-popery party, called the 'know-nothing' party acting chiefly through secret societies, was a singular but transient episode in American politics; though, by breaking up old party affiliations, it doubtless influenced the succeeding election.

In 1856, the republicans, composed mainly of the free-soil party, with some of the less extreme abolitionists, nominated John C. Fremont for the presidency; while the democratic and states'-rights party nominated James Buchanan. Ex-pres. Fillmore received the 'know-nothing' nomination. The popular vote was—for Buchanan, 1,838,169; Fremont, 1,341,264; Fillmore, 874,534. Buchanan was inaugurated 1857, Mar. 4, with John C. Breckinridge, afterward a gen. of the Confederate army, as

vice-pres. A difficulty with the Mormons, which caused the pres. to send a milit. force to Utah, was settled without bloodshed. The efforts of the govt. to execute the Fugitive Slave Law kept up an irritated feeling. There were savage and bloody fights between the pro-slavery and anti-slavery parties in Kansas and on the w. borders of Mo. Resolute and well-armed settlers were sent out by New England emigration societies. 1859, Oct., John Brown, known in Kan. as 'Ossawatomie Brown,' who, with his sons, had been engaged in the struggles in Kan., planned and led an expedition for freeing the negroes in Va. He made his attempt at Harper's Ferry, on the Potomac, where, after a vain attempt to induce the negroes to join him, he and his small party took possession of one of the govt. workshops, where he was taken prisoner by a party of U. S. soldiers, and handed over to the authorities of Va., tried and hanged Dec. 2. His body was taken to his home in N. Y. for burial; and he was regarded by the abolition party as a martyr.

In 1860, the democratic party, which, except at short intervals, had controlled the federal govt. from the election of Jefferson 1800, became hopelessly divided. The southern delegates withdrew from the convention at Charleston; and two democratic candidates were nominated, Stephen A. Douglas of Ill. and John C. Breckinridge of Ky.; while the republicans, or united whig and free-soil party, nominated Abraham Lincoln of Ill.; and the native or 'American' party nominated John Bell of Tenn. The republican convention adoped a moderate and even conservative platform, denounced the John Brown raid, and put forward as a principle, 'the maintenance inviolate of the rights of the states, and especially the right of each state to order and control its own domestic institutions according to its own judgment exclusively.' Still, as the republican party had taken firm stand against further extension of slavery to new states, the country was sectionally divided.

At the election 1860, Nov., Abraham Lincoln received every northern vote in the electoral college except the three of N. J., which were given to Douglas, 180 votes; while Breckinridge received the 72 electoral votes of the south. The north and south had been arrayed against each other, and the south was defeated. Of the popular vote, Lincoln received 1,857,610; Douglas 1,365,976; Breckinridge 847,951; Bell, 590,631. Thus, while Lincoln gained an overwhelming majority of the *electoral* votes given by each state, the combined democratic ballots cast by voters exceeded his by 356,317, and the whole popular vote for other candidates exceeded that for him by 946,948. A small majority, or even plurality, in the northern states was sufficient to elect him.

The south lost no time in acting on what her statesmen had declared would be the signal of their withdrawal from the Union. On Nov. 10, as soon as the result was known, the legislature of S. C. ordered a state convention, which assembled Dec. 17, and on the 20th unanimously declared

that 'the union now subsisting between S. C., and other states, under the name of the United States, is hereby dissolved;' giving as a reason that 14 of these states had for years refused to fulfil their constitutional obligations. The example of S. C. was followed by Miss. 1861, Jan. 8; Fla., 10th; Ala., 11th; Ga , 19th; which were followed by La , and Tex.; and by N. C., Va., Tenn., and Ark. Ky. and Mo. were divided, and had representatives in the govts. and armies of both sections.

1861, Feb. 4, delegates from the 7 then seceded states met at Montgomery, Ala., and formed a provisional govt. under the title the Confederate States of America. A constitution was adopted similar to that of the U. S., and the govt. fully organized, Feb. 18; pres., Jefferson Davis of Miss.; vice-pres., Alexander H. Stephens of Ga.: the govt. was established at Richmond, Va. The secession movement appears to have been nearly unanimous in the more southern states, and to have been carried in all by decided majorities. As state after state withdrew from the Union, its senators and representatives in congress at Washington resigned their seats; and nearly all the officers of the army and navy, of southern birth—believing that their first and final allegiance was due to their states, and that the action of each state carried with it all its citizens —also resigned their commissions, and tendered their swords to their respective states, and to the Confederacy that those states had formed.

Pres. Buchanan, doubting his constitutional power to compel the seceding states to return to the Union, made a feeble and ineffectual attempt to relieve the garrison of Fort Sumter, in Charleston harbor, closely besieged by the forces of S. C. Commissioners were sent to Washington to negotiate for the settlement of the claims of the Federal govt., and great efforts were made to effect compromises of the difficulties, but without result.

1861, Mar. 4, Pres. Lincoln was inaugurated at Washington. In his address he said: 'I have no purpose, directly or indirectly, to interfere with the institution of slavery in the states where it exists. I believe that I have no lawful right to do so, and I have no inclination to do so.' The opening of hostilities was precipitated by the setting out from New York of an expedition with provisions and reinforcements for the garrison of 75 soldiers in Fort Sumter, in Charleston harbor: the unarmed vessel was fired upon and compelled to withdraw. These were the first shots of the civil war. The surrender of the fort was demanded and refused Apr. 11; and the batteries around Sumter, manned by S. C. gunners, opened fire on the fort Apr. 12; and, after a bombardment of 36 hours, the U. S. commander was forced to surrender the place 1861, Apr. 14. The firing on the U. S. flag, and the fall of Ft. Sumter, 'fired the northern heart;' Pres. Lincoln's call for 75,000 vols. to serve 90 days was answered with alacrity—three times that number of men offering themselves. Public sentiment was greatly consolidated in the north for support of the Union and suppression of the rebellion: in the south,

men who had wavered between secession and adhesion to the Union were carried into approval of their states' ordinances of secession: the call of the pres. of the Confederacy for troops, like that of Pres. Lincoln, met cordial response. The border states, Mo., Ky., Md., essayed to be neutral: Del. from the first cast her lot with the Union. The first blood was shed in Baltimore, Apr. 19, when a Mass. regt., on its way to defend Washington, was attacked by a mob. By this time the Confederates had collected a force at Manassas Junction, Va., about 30 m. from Washington, and their line of defense held the left bank of the Potomac from Fortress Monroe almost to the national capital. From Washington the Confederate lines of defense lay w. to Harper's Ferry; thence through the mountains of w. Va. and s. Ky., crossing the Mississippi below Cairo; thence through s. Mo. and the e. border of Kan.; thence s.w. through Indian Terr. and along the n. boundary of Tex. to the Rio Grande. The length of this line, with the southern Atlantic and Gulf coasts, is about 11,000 m. Congress, July 13, authorized Pres. Lincoln to shut up the ports of the seceded states; congress also empowered the pres. to call out 500,000 vols. for 3 years' service. The first battle occurred at Bull Run (or Manassas) July 21; the Union army of raw undisciplined militia was routed. At Wilson's Creek, Mo , there was another collision, Aug. 10; here neither side gained advantage. Ft. Hatteras, N. C., was captured by U. S. forces Aug. 29, and Port Royal, S. C., Nov. 7: thus were two important harbors of refuge won for the blockading fleets. In the mean time Gen. George B. McClellan had defeated the Confederates in several minor engagements in w. Va.; after the repulse at Bull Run he succeeded the aged Gen. Winfield Scott as gen.-in-chief. His first task was to organize the army around Washington. The work of disciplining and fashioning into an effective army the raw levies collected for defense of the national capital and for operations against Richmond, consumed many months; and not till the spring of 1863 was the Army of the Potomac in readiness for a forward movement.

In the mean time, by authority of congress (1862, Feb. 25), the U. S. treasury issued its notes, which by law were legal tender for payment of all debts, and for all purposes except payment of customs duties and of interest on the national debt. Slavery was prohibited in the Dist. of Columbia; and the army was forbidden to restore runaway slaves to their owners.—The Union Pacific Railroad Co. was incorporated the same year, and the govt. lent to the company its credit ($16,000 a mile) to aid in the speedy completion of the road: the company also received alternate sections of the public lands through which its line lay. —Specie payment was suspended 1861, Dec.; the price of gold began to rise rapidly 1862, May: it was 1·70 on the dollar in 1863, and 2·85 in 1864. While prices and rents rose 90 per cent., wages rose only 60 per cent. 1861–66. The Morrill Tariff Act increased the tariff rate on dutiable articles from 18 per cent. (as before 1861) to 50 per cent.

The internal-revenue taxes amounted (1866) to $310,000,000. In the Confederacy the depreciation of the paper currency was far greater than in the loyal states. Prices of various articles were as follows in Richmond 1864, May: pair of boots $200; coat $350; trousers $100; shoes $125; flour, barrel, $275; corn-meal, bushel, $70; bacon, lb., $9; fowls, pair, $30; shad $20; potatoes, bushel, $25; white beans, quart, $4; butter, lb., $15; fire-wood, cord, $50. No beef could be bought.

At the beginning of 1862 the w. part of Va. had separated itself from the parent state. In the w., Gen. Ulysses S. Grant, commanding a part of Buell's army, moved up the Tennessee river, and with a brilliant attack captured Ft. Henry and Ft. Donelson, thus effecting the first great Union success, and breaking the centre of the Confederate line (Feb.). This opened the way for occupation of almost all w. Tenn., including Nashville, the capital. The theatre of war was now 200 m. within the Confederate border. The first great battle of the war was that of Pittsburgh Landing (Apr. 6, 7), where Grant and Sherman sustained the onset of a Confederate army commanded by Gen. Albert S. Johnston. The Union forces held their ground stubbornly till Buell, with the main army, changed the situation, and the Confederates were driven back to Corinth. The southern cause suffered a grievous loss in this action—their great and beloved commander Johnston falling mortally wounded. The Union armies pushed on to Corinth; the Mississippi down to Memphis was freed from the enemy. Thus the Confederate line was set back through Tenn. fully 200 m., and the advantages gained by the national armies here, as in w. Va., were thereafter held. A naval expedition under Farragut and Porter, 1862, Apr. 24, had brilliant success in an engagement with the Confederate fleet and shore-batteries, and, in co-operation with a land-force commanded by Gen. Butler, captured and occupied New Orleans Apr. 25. The fleet then ascended the Mississippi, and cleared the river of Confederate vessels and Confederate works as far as Vicksburg. While the Union cause was thus advancing with great strides in the s. and s.w., the Army of the Potomac was preparing for a movement on Richmond. 1862, Mar. 8, occurred the action between the new U. S. *Monitor* and the *Virginia* (old U. S. *Merrimac*) in Hampton Roads (q.v.)—an engagement which, though itself indecisive, resulted in compelling the Confederate iron-clad to retreat to Norfolk, quieting the alarm of northern cities on the Atlantic coast, and revolutionizing the art and science of naval war. Before the end of another year, the U. S. possessed 75 iron-clad vessels—many hastily prepared for service on the great rivers.

The Confederate army before Richmond occupied strong defensive positions with regard to an attack from the direction of Washington. McClellan therefore wished to take his army to Fortress Monroe, and thence to advance on the Confederate capital, judging that the Confederate armies must follow him; but the pres. and his advisers believed that this course would leave the capital at the mercy

of the enemy, who by a coup might capture Washington. A portion of the army was therefore detached from McClellan's command, put under command of Gen. McDowell, and ordered to take the overland route as far as Fredericksburg, while McClellan moved up the peninsula toward Richmond: as the enemy withdrew from their positions facing Washington to confront McClellan, McDowell was to join the latter. But the main army spent a month (Apr. 5—May 2) quietly before Yorktown; and when McDowell's army was about to join the main force, he met an obstacle in the freshet-swollen Chickahominy. In this situation he was attacked by Gen. Joseph E. Johnston, and beaten at Seven Oaks and at Fair Oaks, in which battles Gen. Robert E. Lee first appeared as commander of a large army. Gen. Thomas J. ('Stonewall') Jackson moved against the Union forces in the Shenandoah valley, drove them to the Potomac, and so filled Washington with alarm that McDowell's army was withdrawn hastily from Fredericksburg for defense of the capital: then Jackson joined Lee, who attacked McClellan at Gaines's Mill 1862, June 27, cutting off the Union army from its base of supplies on the York river. McClellan was forced to move his right wing s. in order to establish a new base on the James river. In this retreat he was hotly pressed by Lee and Jackson, and McClellan reached his objective point only after the 'seven-days' battles'—the most desperate engagements of the war to that date. Gen. John Pope, having succeeded McDowell in command of the army covering Washington, was attacked and beaten by Jackson at Bull Run Aug. 29; McClellan was recalled to defend the capital. On McClellan's retirement from the peninsula, Lee joined Jackson, and the combined army, passing to the n.w. of Washington, passed through the Blue Ridge Mts. into n.w. Md. At Antietam (or Sharpsburg) the Confederate army was overtaken by the Union Army of the Potomac, which had been brought up through Md., and the battle of Antietam was fought 1862, Sep. 17. Both sides claimed victory, but Lee was compelled to retreat to his former position. McClellan—being judged not to have followed up his advantage—was removed from command, and succeeded by Gen. Ambrose E. Burnside. The latter, in an attempt to storm the heights behind Petersburg, suffered a disastrous repulse Dec. 13; he was displaced, and Gen. Joseph Hooker succeeded him.

Soon after the battle of Antietam, Pres. Lincoln issued a proclamation summoning the states in rebellion to return to their allegiance before 1863, Jan. 1, under penalty of having all slaves within their borders declared free men. No state complied with the demand, and Jan. 1 the slaves were declared free: for his proclamation, see SLAVERY. The Confederate agents in Europe purchased in England (1862) the fast steamers *Alabama* and *Florida*, and, having put armaments on board, sent them to sea to prey on American commerce. Soon the flag of the U. S. disappeared from the ocean, most of the ocean going shipping being transferred under the flags of other nations. An-

other Confederate cruiser, the *Georgia*, was afloat 1863. These three cruisers were destroyed in naval conflicts 1864.

While Lee was invading Md., Gen. Braxton Bragg, commanding the Confederate armies in Miss., having turned the Union line in s. Tenn., passed into Ky., and on retiring into Tenn. bore away much booty. Gen. William S. Rosecrans toward the end of 1862 moved forward from Nashville to attack Bragg, and there was an obstinate struggle, with indecisive result, at Murfreesboro Dec. 31 and 1863, Jan. 1, 2. The western U. S. armies were now four: that of Rosecrans at Murfreesboro, that of Grant at Corinth, that of Schofield in Mo. and Ark., and that of Banks in La. It was of vital importance to open the Mississippi completely, and the possession of Vicksburg by the Confederates was the remaining obstruction to be removed. The task of conquering this strong position was assigned to Grant. He sought first to take the place from the w. bank of the river. That attempt failing, he crossed the Mississippi s. of Vicksburg, transferring his army in the boats of the river fleet. Here Grant's army had on one side of him, at Jackson, Miss., Gen. Joseph E. Johnston with an inferior force of Confederates: on the other side was Vicksburg, a fortified place occupied by the bulk of the choicest Confederate troops in the w. under Gen. Pemberton. The two Confederate gens. were at variance: Pemberton did not wish to owe his expected victory over Grant to Johnston. Grant fell on Johnston's army, scattered it, and made its junction with Pemberton impossible; then advancing toward Vicksburg, fighting several sharp battles as he went, he had Pemberton shut up in Vicksburg before the end of May. Pemberton, after a six weeks' siege and continual assaults, surrendered to Grant 1863, July 4 (30,000 prisoners of war, 200 cannon, and 70,000 stand of arms). Port Hudson having surrendered to Gen. Banks July 9, the Mississippi was in the power of the Union armies through its entire length, and the Confederacy was cleft in twain. West of the great river no regular military operations were carried on thereafter, except those which resulted in the defeat of Banks in n.w. La. 1864. The fighting capacity of the Confederacy was seriously reduced by the loss at Vicksburg, whose surrender was only one day after the great Union victory at Gettysburg. While Grant was occupied at Vicksburg, Rosecrans was moving from the e. end of the Union line in Tenn. against Bragg at Chattanooga. Bragg was compelled to retire into Ga., whither Rosecrans pursued him; but with disastrous result, for the pursuing army was defeated at Chickamauga creek 1863, Sep. 19–20. At Chattanooga, whither the Union army retreated, Bragg, having occupied all the mountains around, was confident of his ability to compel a surrender of the entire Union force. A part of Bragg's army was even detached under Longstreet to besiege Knoxville. Grant was now ordered to the command at Chattanooga: with him were Gen. William T. Sherman and other officers who had taken part in the operations at Vicksburg. Grant quickly reopened com-

munication with the rear; brought in supplies and reinforcements; and gave the order to dislodge the enemy from his commanding positions on the mountains. Lookout Mountain and Missionary Ridge were brilliantly taken by assault (Nov. 23–25). Bragg was removed, giving place to Gen. Joseph E. Johnston; and Longstreet withdrew from the siege of Knoxville, retreating across the mountains into Va.

In the e., the Army of the Potomac, under Hooker, lay at Fredericksburg till 1863, May. Attempting to cross the Rapidan on the way to Richmond, Hooker suffered defeat in the battle of Chancellorsville May 2–3. The Confederate army lost in that action Gen. 'Stonewall' Jackson. In June, Lee was preparing for another invasion of the north, and toward the end of the month his army began to advance northward along nearly the route followed 1862: the Union Army of the Potomac, now commanded by Gen. George G. Meade, held a nearly parallel course through Md. into s. Penn. The Confederate advance penetrated Penn. almost to Harrisburg; but the two main opposing armies met at Gettysburg. The Confederate army was defeated (1863, July 1–3) after a terrific struggle, with great loss; in this battle it lost much of its *prestige*, and was never again what it had been. Then for a time the opposing hosts confronted each other across the Rappahannock, having come back once more to nearly the same relative positions which they occupied at the beginning of the war; but greatly changed was the relative situation of the two contestants both in war resources and in financial ability. The blockade of the Confederacy's ports was almost perfect; the railroads of the north, and of the south as well (for all the great southern lines, except those of Ga., were now held by the Union armies), were at the service of the national govt. for rapid transportation of troops; similarly with the telegraph lines: and among the many important developments of the art of war introduced during this war, not the least was the systematic use of these two agencies. Two army corps comprising 23,000 men, with the needful *matériel*, were transferred from Washington to Chattanooga, 1,200 m., in 7 days (1863); and such transfers were not rare. Conscription was resorted to by the Confederacy to fill its ranks; the Federal govt. enacted a conscription law first 1863. The enforcement of the law provoked bloody and frightful riots in New York in July, on the part of the lower classes of southern sympathizers in that city; but opposition was put down promptly, and the law was executed throughout the country: the several states, however, were left free to fill the draft by means of volunteers stimulated by offer of large bounties; drafted men also were allowed to hire and present substitutes.

Ulysses S. Grant was appointed lieut.gen. early in 1864, and intrusted with command of all the U. S. armies. Leaving Sherman at Dalton, Ga., to confront Gen. Johnston, Grant repaired to Washington to meet Lee. Crossing the Rapidan, he entered the Wilderness early in May

with an army variously estimated, but much larger than that of Lee; simultaneously 30,000 men were dispatched up the James river under Gen. Butler, to co-operate. After 2 weeks of hard fighting (May 5–18) and 4 days at North Anna (23–27), the further advance of the Army of the Potomac on Richmond was stoutly contested at Cold Harbor, near the Confederate capital. An attack in force was repulsed with serious loss to the Union arms; and Grant, recognizing the impregnability of Lee's position there, sought a weak spot elsewhere in Lee's lines on that side of Richmond, but found none. Crossing the James and reaching Petersburg, where he was within striking distance of the southward railroad lines on which Lee depended for his supplies, Grant found opposed to him there a strong Confederate army, which stayed his advance to the railroads. To weaken the Union army before him by creating a necessity for detaching a part of it for the defense of Washington, Lee now sent Early with a force up the Shenandoah valley to threaten the national capital (July). But Grant did not wait for the appeal from Washington: he detached a command under Gen. Philip H. Sheridan to meet Early, whose army was crushed by Sheridan at Cedar Creek (Oct.).

The army commanded by Sherman in n.w. Georgia advanced against Gen. Johnston 1864, May 5, the same day in which Grant crossed the Rapidan. Johnston retired slowly before Sherman till he reached Atlanta in the middle of July; and Johnston was superseded in the command July 17 by Gen. Hood, who was expected to assume an aggressive attitude. Hood made three furious attacks on Sherman, in each suffering defeat. At length, his lines of communication being cut, he had to retreat, and Sherman's army entered Atlanta Sep. 2. Hood then countermarched, and headed his force for Tenn., hoping that Sherman would start in pursuit of him. But Sherman sent Gen. Thomas back to Nashville to confront Hood—taking command of the forces there and of reinforcements ordered from the west. Hood's army was routed by Gen. Thomas (Dec.). Gen. Sherman had after the taking of Atlanta 60,000 veteran troops; and, far as he was in the interior of the Confederacy, no organized Confederate force stood between his rear and Lee's army, for Hood's army never rallied after its defeat at the hands of Gen. Thomas. After the capture (Aug. 5) of Mobile by Farragut, only one Confederate seaport, Wilmington, N. C., remained to the enemy. 1864, Nov. 16, Sherman sent his wounded north, and began the 'march through Georgia to the sea.' He destroyed the railroad and telegraph line by which he had kept communication with the north, and, marching eastward, reached Savannah Dec. 12. Savannah was taken Dec. 20. He moved n. from Savannah 1865, Jan. 15; and reaching Fayetteville, N. C., he there rested, holding in check the force assembled under Gen. Johnston, and thus preventing it from joining Lee.

In the beginning of Mar. (1865), Sheridan, with a cavalry force, moved from the valley of the Shenandoah, and

joined Grant before Petersburg. Grant was working his lines steadily around Petersburg on the s., so compelling Lee to defend a longer line with a reduced force. Grant put Sheridan in command of the Union left; and Sheridan, advancing to Five Forks, destroyed the Southside railroad, another of Lee's lines of supply. This movement made necessary a further extension of Lee's defense-line. When the line had been duly extended, and consequently weakened at every point, a general advance of Grant's army was made. Petersburg was taken; Richmond was occupied by the victors; Pres. Jefferson Davis and the whole *personnel* of the Confederate govt. fled to N. C.; Lee was surrounded and compelled to surrender unconditionally Apr. 9. No prisoners were held by Grant, officers and men alike being permitted to go their ways on parole, and even to take their horses with them—Gen. Grant remarking that they 'would need them for their spring-plowing.' He gave them assurance that they should not be disturbed by the U. S. govt. so long as they were true to their parole and obeyed the laws. The surrender of Johnston to Sherman followed Apr. 26. The war was ended.

[Throughout this historical sketch, see for further details the respective titles of principal persons, places, battles, etc., mentioned herein.]

The war was scarcely ended when 800,000 men of the national armies were paid off. During the war the number of men called for by the U. S. govt. was 2,759,049; the number actually furnished was 2,653,062. Of colored troops there were 186,097. The state of N. Y., with pop. less than 4,000,000, sent 223,836 men into the field. There was an annual waste of one-third, half of which was by wounds in battle. The Federal losses during the war were estimated at 316,000. In the Union armies there were a little more than 1,000,000 men 1865, Mar. In 1864 the Confederate army consisted of 20,000 artillery, 128,000 cavalry, 400,951 infantry; the entire available force enrolled did not exceed 700,000. The Confederate losses are said to have amounted to 300,000. The U. S. debt, incurred on account of the war, reached the maximum, $2,845,907,626.56, 1865, Aug. 31; besides this, about $800,000 of revenue had been expended. States, counties, towns, etc., also expended large sums and incurred heavy obligations for war purposes. The value of property destroyed in the south (apart from the value of the liberated slaves, $2,000,000,000) cannot be estimated; probably the total loss and expenditure was not less than $8,000,000,000. To this add the expenditure on account of pensions (see PENSIONS AND PENSIONERS).

1865, Mar. 4, Abraham Lincoln entered on his second term of the presidency; the vice-pres. was Andrew Johnson, of Tenn. On Apr. 14, while the north was rejoicing over the capture of Richmond and the surrender of the Confederate armies, the pres. was assassinated at a theatre in Washington, by John Wilkes Booth, an actor; while an accomplice attacked and nearly killed William H. Seward,

sec. of state. The assassin was pursued and killed, and several of his accomplices were tried and hanged. Andrew Johnson became pres. Jefferson Davis and the members of the Confederate govt. were supposed to be privy to the assassination of President Lincoln, and large rewards were offered for their apprehension. Davis was captured in Ga., and placed in Fortress Monroe, but was released without trial 1867, May. An amendment to the constitution forever abolishing slavery in the states and territories of the Union was declared ratified by two-thirds of the states 1865, Dec. 18. The vast change in the organization of the republic made by this new fundamental law was completed by the 14th and 15th amendments, passed 1868 and 1870, which gave to the former slaves all the rights and privileges of citizenship. But the reconstruction of the Union presented a difficult constitutional and practical problem. Before Pres. Lincoln's death state govts. had been organized by the executive of the U. S. in Va., Tenn., La., and Ark., and amnesty was assured to all citizens of the Confederacy who would take oath to support the Federal govt. and the abolition of slavery; state govts. set up by the acts of such voters were recognized as lawful and regular. But the situation was materially altered after the assassination of Abraham Lincoln. Then congress, never content with the terms of settlement proposed by Lincoln, favored different plans of reconstruction, all of them exacting from the states that had revolted conditions far more stringent than those required by Pres. Lincoln. The 7th article of Gen. Sherman's 'memorandum' to Gen. Joseph E. Johnston was ignored as being plainly *ultra vires:* in that art. Gen. Sherman, who represented himself as being 'fully empowered to arrange terms for the suspension of hostilities,' promised to the officers and men of Johnston's army and to all the Confederates then in arms 'a general amnesty,' on condition of disbandment of the Confederate army. Pres. Andrew Johnson, during the months intervening between his succession to the presidency, 1865, Apr., and the assembling of congress in Nov., reorganized the govts. of all the states of the late Confederacy, the condition precedent being their acceptance of the 13th amendment of the U. S. constitution. But congress refused to receive them back on such terms, yet made one exception in favor of the state govt. of Tenn.: that state was admitted to all the rights of statehood 1866. The legislatures of the states recognized by the pres. at once began to enact contract and vagrancy laws, under which the freedmen would be kept in a state little different from slavery. The pres. and congress were soon in irreconcilable conflict. The pres. vetoed acts passed by congress, such as the Freedmen's Bureau Act, the act admitting Nebraska to the Union (1867), the Tenure of Office Law (whose sole purpose was to tie the hands of the then chief executive), and the Reconstruction acts; but congress in every case overrode the presidential veto. By the Reconstruction acts the states of the fallen Confederacy (Tenn. excepted) were made military dists., the com-

mmanding gen. of each of which was empowered to deny to the state govt. the exercise of any powers which might be used to the prejudice of the freedmen. The state govts. themselves were to be merely provisional, until legislatures and executive officers chosen by their whole citizenship—without regard to race, but with exclusion from suffrage of certain leaders in the secession movement—should recognize the principle of manhood-suffrage and ratify the 14th amendment to the constitution: see CONSTITUTION OF THE UNITED STATES. In nearly all of the once rebel states these conditions were complied with, and govts. set up mostly by the votes of the freedmen. The struggle between pres. and congress reached its height 1868, when, for having violated the Tenure of Office Law by removing Edwin M. Stanton from the war secretaryship, Andrew Johnson was brought to trial before the senate. The necessary two-thirds vote for conviction could not be obtained, and Johnson completed his term amid unceasing strife. The presidential election of 1868 was triumphantly won by the republicans, and Johnson was succeeded by Gen. Ulysses S. Grant 1869, Mar. 4. The states once forming the Confederacy had all, except Va., Miss., and Tex., been admitted to the full rights of statehood 1868, June, and they voted in that election. The legislatures of those states were filled mostly with freedmen, and the chief executive offices by freedmen or by 'carpet-baggers'—i.e., white republicans from the north. The 15th amendment, having been ratified by a sufficient number of states, went into effect 1870. The three states which had rejected the earlier terms of readmission to the Union were now required not only to comply with these terms, but, further, to ratify this amendment. Not until 1871, Jan., were all the states represented in congress.

In 1867 the U. S. acquired by purchase the whole of Russian America (see ALASKA). In 1872 the Alabama (see ALABAMA, THE) Arbitration gave its decree in favor of the U. S.; and the San Juan boundary dispute with Great Britain was settled on the same side by the emperor of Germany. The outrages of a secret organization known as the Ku-Klux Klan, in the southern states, necessitated the passing of an act, 1871, giving cognizance of such offenses to the U. S. courts.

The year 1876, memorable in the annals of the republic as the hundredth anniversary of the Declaration of Independence, was celebrated by a great Centennial Exhibition at Philadelphia. The presidential election of the same year was of more than usual interest. Gen. Ulysses S. Grant (q.v.), chosen pres. 1869, had been re-elected 1873. When the result of the keenly contested election toward the close of 1876 began to be made known, it seemed at first favorable to the election of Samuel J. Tilden, the democratic candidate. But many of the returns from some southern states were disputed, and for months there was intense excitement. At last a special tribunal, selected from the senate, the house of representatives, and

the judges of the supreme court, was appointed to examine the election returns: the result was that Rutherford B. Hayes, the republican candidate, was declared to have been elected pres., and inaugurated 1877, Mar. 4.—A period of great commercial depression, not confined to the U. S., reached a height in 1877, and was accompanied by alarming difficulties between labor and capital. A measure was passed 1878, in spite of the president's veto, making silver a legal tender equally with gold, though silver was then 11 per cent. less in value. A marvellous recovery in trade rendered comparatively easy, 1879, the resumption of specie payments. Antipathy to the Chinese immigrants in the Pacific states raised, about this time, a violent agitation. The wheat crop and exportation 1882 and 84 were unprecedentedly large; subsequent years showed decrease. In 1879 there was, for the first time since the civil war, a democratic majority in both houses of congress; but the presidential elections in 1880 gave a large majority for the republican candidate, Gen. Garfield, though the 'Solid South' voted for Gen. Hancock, the democratic candidate. Garfield (q.v.), installed 1881, Mar. 4, died in Sep. of that year from the effects of an assassin's shot. Thereupon the vice-pres., Gen. Arthur, succeeded to the presidency. The continued development of the U. S., as shown in the returns of the census 1880, led to an almost embarrassing surplus of revenue, and was held by many to call for a revision of the tariff. There was, however, stagnation in several departments of industry 1882–85. At the election of 1884 the candidates were James G. Blaine, republican, and Grover Cleveland, democrat. Cleveland (1885–89) was the first democratic pres. elected since Buchanan: he owed his election to a strong defection of republicans from their party, through hostility to James G. Blaine. Toward the close of his administration, Cleveland, in a message to congress, strongly advocated the policy of reducing the tariff rates. On an appeal to the people for re-election on this issue he was defeated by his republican competitor, Gen. Benjamin Harrison (grandson of the first Pres. Harrison), who received the suffrages of 233 presidential electors, Cleveland receiving only 168; though the votes returned for the democratic (Cleveland) electors exceeded those for the republican (Harrison) electors by 98,017, the total democratic vote being 5,538,233, and the total republican vote 5,440,216. Pres. Harrison's administration was supported by republican majorities in senate and house of representatives. The most memorable event of U. S. history in Harrison's term of office was the passing of the McKinley Tariff Act: under this law a degree of commercial reciprocity was arranged between the U. S. and several other countries. The wheat harvest 1891 was of unprecedented amount. Unfortunate disputes with Italy and with Chili—that with Chili seeming at one time likely to eventuate in war—were happily settled.

In the presidential campaign of 1892 the repub. candidates for pres. and vice-pres. were Benjamin Harrison and

Whitelaw Reid; the dem., Grover Cleveland and Adlai E. Stevenson; the pop., James B. Weaver and James G. Field; the pro., John Bidwell and James B. Cranfill; and the social labor, Simon Wing and Charles H. Matchett. The election resulted in the choice of the dem. candidates, who received 5,554,685 popular votes, a plurality of 382,352, and 277 electoral votes. The 53d congress (1893–5) opened with 44 democrats, 38 republicans, and 3 populists in the senate, with 3 seats in doubt; and with 220 democrats, 126 republicans, and 8 populists in the house, with two members to be elected in R. I. The second administration of Pres. Cleveland had several notable features. At its beginning the pres. withdrew from the senate the draft of a projected treaty with Hawaii, providing for the annexation of the islands to the U. S.; sent a special commissioner to investigate the facts concerning the revolution in Honolulu, the dethronement of the queen, and the establishment of a provisional govt.; and vainly endeavored to have congress right what he pronounced a wrong done the monarchy in the name of the U. S. The opposition to the pres. developed in this case, not only by his political opponents, but by a strong faction in his own party, continued to the close of the term, and was at no point more effective than in thwarting the various attempts of the administration to carry out financial legislation. A new tariff bill, bearing the name of Chairman Wilson of the house committee on ways and means, was introduced 1893, Dec. 19; passed in greatly amended form by the senate in 1894, Aug. 13; and became a law without the approval of the pres. In 1895, Apr., the U. S. supreme court declared two of the income-tax provisions unconstitutional, and upheld the remainder, and May 20 following, on a rehearing, declared the whole measure unconstitutional. A new treaty with China was concluded 1894, Mar. 17, and a commercial and reciprocal treaty with Japan, Nov. 22 following. Amnesty and pardon were proclaimed to all persons convicted of polygamy, 1894, Sep. 27. The pres., as arbitrator, decided the boundary dispute between Brazil and the Argentine Republic in favor of the former 1895, Feb. 6. The services rendered by the U. S. representatives in China and Japan during the war between those countries, were acknowledged by the respective emperors in autograph letters to the government. In 1895, Dec., the pres. called the attention of congress to the boundary dispute between Great Britain and Venezuela; and later laid before that body the correspondence between the U. S. and British govts. on the subject, and recommended the appointment of a commission to determine the divisional line in dispute. The message created large excitement throughout Europe and America; congress granted the authority; and the pres. appointed the commission 1896, Jan. 1. This action precipitated fears of serious international trouble, and both houses of congress adopted liberal initial measures for the defense of the country. The elections to the 54th congress (1895–97), resulted in the political composition of the houses as

follows: senate, 45 repub., 39 dem., 6 pop.—total, 90; house, 249 repub., 103 dem., 6 pop., 1 silver, 1 vacancy—total 360. In 1894, Jan., Sec. Carlisle, of the treas. dept., issued a call for the purchase of $50,000,000 of 5 per cent. bonds, for the purpose of retaining the gold reserve, and received $58,660,917 in gold. In Nov. following, a second call for $50,000,000 brought subscriptions aggregating $178,341,150, and the amount accepted at 117·077 was $58,-538,500. Extraordinary withdrawals of gold led the pres., 1895, Jan 28, to ask authority of congress for the sec. of the treas. to issue bonds at a low rate of interest to maintain the reserve and redeem notes issued for the purchase of silver; but congress refused to grant the authority. The sec. then signed a contract with a syndicate to supply the govt. with 3,500,000 oz. of standard gold coin at the rate of $17.80 per oz., for 30-year 4 per cent. bonds, on the condition that one-half of the coin should be obtained and shipped from Europe. Pending the execution of the contract, the pres. again asked congress for authority to issue 3 per cent. gold bonds, pointing out that more than $16,-000,000 would be saved in interest by such bonds; but congress again withheld its sanction. The contract was executed, and bonds aggregating $62,315,000 were sold for a little more than $65,000,000 in gold. Again, 1896, Jan. 5, the sec. was obliged to ask proposals for $100,000,000 of 30-year 4 per cent. bonds, and the responses covered $568,269,850, at prices ranging from par to more than 120. On the allotment, individual bankers and bidders were given $62,088,650, and a syndicate $37,911,350. For the presidential campaign of 1896, the repub. party adopted a sound-money, or gold, platform, and nominated William McKinley, of O., for pres., and Garret A. Hobart, of N. J., for vice-pres.; the dem. party pronounced for the unlimited coinage of silver at 16 to 1, and the reorganization of the U. S. supreme court, and nominated William J. Bryan, of Neb., for pres., and Arthur Sewall, of Me., forvice-pres.; the pop. party endorsed the dem. platform and candidate for pres., and nominated Thomas E. Watson of Ga., for vice-pres.; the pro. party nominated Joshua Levering, of Md., for pres., and Hale Johnson of Ill., for vice-pres.; the social labor party nominated Charles H. Matchett, of N. Y., for pres., and Mathew Maguire, of N. J., for vice-pres.; and the national silver party endorsed the dem. nominations. The action of both the repub. and dem. national conventions on the money question caused much dissatisfaction in each party. The few silver delegates to the repub. convention withdrew in a body after the nominations; and the sound-money dem. leaders held a convention and, Sep. 3, nominated John M. Palmer, of Ill., for pres., and Simon B. Buckner, of Ky., for vice-pres. McKinley was elected, receiving 271 electoral and 7,102,447 popular votes, and a plurality of 597,486, the largest since Grant's election in 1872, and the only pres. since Grant elected by a *majority* of the popular vote. See PRESIDENT AND VICE PRESIDENT, ELECTIONS OF.

The year 1898 was but a few months old when the United States found itself at war with Spain. Brought about by

hostile demonstrations against Americans in Havana, the publication of a letter written by Señor de Lome, Spanish minister at Washington, which contained insulting allusions to President McKinley, and the destruction of the U. S. battleship *Maine*, while on a friendly visit in the harbor of Havana, and the loss of 266 American lives, members of her crew—all these events led to the Spanish-American war, which was begun by Spain, 1898, April 21, when she returned the American minister at Madrid, Gen. Woodford, his passports.

Another cause, and this led to the decision of Congress to intervene in Cuban affairs and to grant the insurgents belligerent rights, was Spain's inability to subdue the rebellion and her declining to recognize the independence of the island. When Captain-General Weyler resigned 1897, Oct. 6, and General Blanco succeeded him, an attempt was made to give Cuba a shadowy form of autonomous government and amnesty was proclaimed. But the insurgents paid no heed to Spanish offers, which were deemed insincere, and fighting continued. The awful results of General Weyler's orders to lay the plantations bare, burn the dwellings of the people, and drive them into military zones, where they died from starvation and disease, horrified the American people, and Congress was urged to interfere for the sake of humanity.

Owing to the anti-American demonstrations by Spanish volunteers at Havana between Jan. 15 and 20 the governor-general found it necessary to place a military guard around the U. S. consulate. This caused intense excitement in the U. S. and the battleship *Maine* was dispatched to Havana harbor Jan. 24 ostensibly on a friendly visit, but really to afford protection to American citizens in case of necessity.

Following this came the publication of De Lome's letter (Feb. 9) maligning President McKinley, which resulted in his resignation and recall, and the blowing up of the *Maine* (Feb. 15) in Havana harbor. On receipt of the news public feeling throughout the U. S. was thoroughly aroused. Congress immediately voted $200,000 for the employment of divers to investigate the cause of the destruction of the vessel and to raise her if found practicable. A court of inquiry to find out the cause of the disaster was appointed Feb. 18, and began its investigations at Havana three days later. Foreseeing the result of the investigation and the strained relations likely to arise between the U. S. and Spain, Consul-General Lee advised all Americans not necessarily detained in Cuba to leave for home at once. This action, together with the jealous care with which he protected American citizens and interests, and his intense patriotism, led to a Spanish demand for his recall, which was made March 5 and promptly refused.

Strong evidence having been obtained by the court of inquiry that the *Maine* was blown up by a submarine mine a wave of indignation at what was believed to be an act of treachery swept over the U. S. The court held session in Havana for four weeks, and reached an unanimous decision

March 21 that the loss of the *Maine* was not in any respect due to fault or negligence on the part of any of the officers or members of her crew; that the ship was destroyed by the explosion of a submarine mine, which caused the partial explosion of two or more of her forward magazines; and that no evidence has been obtainable fixing the responsibility for the destruction of the *Maine* upon any person or persons."

By this time public opinion was fully aroused. Congress had previously adopted unanimously a resolution establishing a defense fund of $50,000,000, and on March 29 resolutions declaring war on Spain and recognizing the independence of Cuba were introduced into both houses, and the House of Representatives passed a resolution favoring U. S. intervention into Cuban affairs April 13. In the meantime Consul-General Lee, who had recalled all the American consuls on the island, left Havana with a large number of American residents. In Spain mobs made hostile demonstrations before the American consulates at Barcelona, and Malaga, breaking the windows of the buildings and smashing the furniture. These riots continued till the eve of the withdrawal of the American minister April 21, when actual hostilities began. On the following day the North Atlantic squadron sailed from Key West under Admiral Sampson to blockade all Cuban ports. On its way the gunboat *Nashville* captured the first prize of the war, a Spanish vessel, the *Buena Ventura*.

A call for 125,000 volunteers was issued by President McKinley April 23 and a proclamation announcing the war was made to the neutral powers. Coal was declared contraband of war by Great Britain April 21, and this was followed on the 24th by her declaration of neutrality. The other European nations, with the exception of Germany, also declared themselves neutral.

About this time Commodore Dewey (q.v.), who had received instructions from Washington to capture or destroy the Spanish Pacific fleet, set sail from Hong Kong, and arriving off Manila Bay April 30 forced his way past the batteries of Corregidor island and on May 1 sank the Spanish fleet off Cavité, a suburb of Manila (q.v.), silencing the forts and capturing the arsenal. For this daring deed Dewey (q.v.) was made a rear-admiral ten days later. Two months later another Spanish fleet under the command of Admiral Cervera, which arrived at Santiago de Cuba (q.v.) May 19, was sunk by the North Atlantic squadron under Admiral Sampson, with Commodore Schley second in command,

A second call for volunteers numbering 75,000 men was issued by the President May 25, and on June 10 the war revenue bill was passed by Congress, becoming operative shortly after. On the 14th an army of invasion under General W. Shafter (q v.), consisting of 16,000 men, sailed from Key West for Santiago, and arrived at Daiquiri, Cuba, June 20. Active military operations were begun, and after several brilliant engagements (see ROUGH RIDERS; SANTIAGO) in which the Spaniards under Gen. Pando were

defeated, the surrender of Santiago was demanded and made July 17. On the 20th Gen. Leonard Wood was appointed military governor of the city.

The last naval engagement on the Cuban coast occurred July 21, when four U. S. warships entered the harbor of Nipe and captured the port after a furious bombardment.

Another military expedition was organized by the commanding general of the U. S. army, Nelson Miles, and set sail for Porto Rico (q.v.) under his charge. Landing at Guanica on July 25 the army attacked the town, which surrendered quickly, as did also Ponce on the 28th. Plans having been made for a concerted attack of San Juan, orders to advance were impending when news was received of the cessation of hostilities. On July 26 the French minister on behalf of the Spanish government asked for terms of peace, and three days later these were stated by President McKinley.

In the meantime several military expeditions had been prepared and set sail for the Philippines, where the Spaniards were inclined to offer resistance. Commanding one of these Gen. Wesley Merritt landed at Cavité, Manila, July 29 and lost no time in attacking the Spaniards. Jointly with Dewey he advanced on Manila, which surrendered after a short bombardment by the fleet and a brisk land fight which threatened to turn into an assault, on Aug. 13.

Secretary of State Day, Senator Davis of Minnesota, Senator Frye of Maine, Whitelaw Reid of New York, and Senator Gray of Delaware, having been appointed by the President as peace commissioners Sept. 9, set sail for Paris, where the commission were to meet the Spanish appointees Sept. 17, and held their first session Oct. 1.

For thirty days the Spanish peace commissioners contended earnestly for the assumption of the Cuban debt by the U. S. without avail. On the 31st the American commissioners presented the demand of the United States for the Philippines, which was eventually accepted on the payment of $20,000,000.

The terms of the peace protocol were:

"Article 1—Spain will relinquish all claim of sovereignty over and title to Cuba.

"Article 2—Spain will cede to the United States the island of Porto Rico and other islands now under Spanish sovereignty in the West Indies and also an island in the Ladrones to be selected by the United States.

"Article 3—The United States will occupy and hold the city, bay, and harbor of Manila pending the conclusion of a treaty of peace which shall determine the control, disposition, and government of the Philippines."

The fourth article provided for the appointment of joint commissions on the part of the United States and Spain, to meet in Havana and San Juan, respectively, for the purpose of arranging and carrying out the details of the stipulated evacuation of Cuba, Porto Rico, and other Spanish islands in the West Indies.

The fifth article provided for the appointment of not

more than five commissioners on each side, to meet at Paris not later than October 1, and to proceed to the negotiation and conclusion of a treaty of peace, subject to ratification according to the respective constitutional forms of the two countries.

The sixth and last article provided that upon the signature of the protocol hostilities between the two countries should be suspended and that notice to that effect should be given as soon as possible by each government to the commanders of its military and naval forces.

Under terms of the protocol the President appointed military commissions to superintend the evacuation of Cuba, Porto Rico, and adjacent islands, as follows:

For Cuba—Maj.-Gen. James F. Wade, Rear Admiral Wm. T. Sampson, and Maj.-Gen. Matthew C. Butler.

For Porto Rico—Maj.-Gen. John C. Brooke, Rear Admiral Winfield S. Schley, and Brig.-Gen. Wm. Gordon.

These soon afterward met the Spanish commissioners at Havana and San Juan, respectively, and by October 18 the joint commission for Porto Rico had completed its work, the Spanish troops had evacuated the island, and at noon that day the U. S. flag was raised. Owing to the difficulty of removing large numbers of troops, the Cuban joint commission did not conclude its task until some weeks afterward.

The essential features of the treaty of peace were as follows:

"1. The customary preface of treaties, in the nature of an expression of amity and of hope for perpetual peace.

"2. The relinquishment by Spain of her sovereignty over Cuba.

"3. The withdrawal of the Spanish troops.

"4. The relinquishment by Spain of her sovereignty over Porto Rico.

"5. Spain's cession of the Philippines.

"6. The withdrawal of the Spanish troops there.

"7. Payment by the United States of $20,000,000 for the Philippines.

"8. The provision for the open commercial policy in the Philippines."

The treaty also provides for the cession of the island of Guam of the Ladrone group to the United States. The treaty was formally concluded and signed at 8:45 P.M. on December 10.

Details as to the evacuation of the Philippines, coaling stations elsewhere, religious freedom in the Carolines, transporting home the prisoners, garrison, and sailors at Manila, and the soldiers and citizens held by the Filipinos, the liberation of all Cuban, Porto Rican, and Philippine political prisoners, the matter of certain free shipping for Spain, the status of patents and copyrights—these were considered subsequently by the joint peace commission and the Congress and Cortes of the respective countries.

Government.—The govt. of the U. S. is based on a federal system deriving vitality from the constitution of

1787–89, which took the place of the 'articles of confederation,' drafted by the continental congress and adopted 1778. Both compacts were drafted and adopted by duly chosen representatives of the whole people; and while reserving large powers to the several states, each conceded to the congress certain comprehensive powers in order to insure greater general protection, a closer union, and a larger mutual and national welfare (see CONFEDERATION OF THE THIRTEEN AMERICAN COLONIES). The Constitution of the U. S. (q.v.) distinctly specifies the powers which the people of the states were willing to grant to the federal govt., and prohibits both the general govt. and the states from exercising certain powers, the one against the other; thus preserving to the states a large freedom in all matters pertaining to their own govt., and giving to the federal govt. rights to be exercised for defense and advancement of all the states as a single national body (see the CONSTITUTION, Art. I. Sec. 8, 9, 10).

Under the constitution the executive authority is vested in a pres., elected for four years; his salary is $50,000 per annum, with family and official residence in the executive mansion, popularly known as the White House. No person excepting a natural-born citizen who has attained the age of 35 years is eligible to the office. A vice-pres. is elected at the same time and for the same term as the pres.; he has a salary of $8,000 per annum, and is pres. of the senate or upper branch of the congress. In case of the removal of the pres. from office, or of his death, resignation, or inability to discharge his official duties, the vice-pres. succeeds to the executive authority; and, by act of congress approved 1886, Jan. 19, in case of the inability of the pres. and the vice-pres. to act, the sec. of state shall act as pres. during the disability; if there be no sec. of state, then the sec. of the treas. shall act; and the remainder of the succession is the sec. of war, atty.gen., postmaster-gen., sec. of the navy, and sec. of the interior, provided in each case that the officer succeeding to the executive authority had been appointed to the cabinet by the advice and consent of the senate, and also was eligible to the presidency under the constitution.

From the adoption of the federal constitution till the time of writing (1903) there were 29 presidential terms and 25 *Presidents*—viz.: (1) Geo. Washington, federalst, 2 terms, 1789–97; (2) John Adams, federalist, 1797–1801; (3) Thomas Jefferson, republican (see POLITICAL PARTIES), 2 terms, 1801–09; (4) James Madison, republican, 2 terms, 1809–17; (5) James Monroe, republican, 2 terms, 1817–25; (6) John Quincy Adams, republican, 1825–29; (7) Andrew Jackson, democrat, 2 terms, 1829–37; (8) Martin Van Buren, democrat, 1837–41; (9) William Henry Harrison, whig, 1841, Mar. 4—Apr. 6; (10) John Tyler, democrat, 1841, Apr. 6—1845; (11) James K. Polk, democrat, 1845–49; (12) Zachary Taylor, whig, 1849, Mar. 5—1850, July 9; (13) Millard Fillmore, whig, 1850, July 9—1853; (14) Franklin Pierce, democrat, 1853–57; (15) James Buchanan, democrat, 1857–61; (16) Abraham Lincoln, republican, twice

elected, 1861–65, Apr. 15; (17) Andrew Johnson, republican, 1865, Apr. 16—1869; (18) Ulysses S. Grant, republican, 2 terms, 1869–77; (19) Rutherford B. Hayes, republican, 1877–81; (20) James A. Garfield, republican, 1881 Mar. 4—Sep. 20; (21) Chester A. Arthur, republican, 1881, Sep. 20—85; (22) Grover Cleveland, democrat, 1885–89; (23) Benjamin Harrison, republican, 1889–93; Grover Cleveland, democrat, 1893–97; (24) William McKinley, republican, 1897-1901; (25) Theodore Roosevelt, republican, 1901- . The *Vice-presidents* were: John Adams, 1789-97; Thomas Jefferson, 1797–1801; Aaron Burr, 1801–05; George Clinton, 1805–13; Elbridge Gerry, 1813–17; Daniel D. Tompkins, 1817–25; John C. Calhoun, 1825–33; Martin Van Buren, 1833–37; Richard M. Johnson, 1837–41; John Tyler, 1841–45; George M. Dallas, 1845–49; Millard Fillmore, 1849, Mar. 5—1850, July 9; William R. King, 1853–57; John C. Breckinridge, 1857–61; Hannibal Hamlin, 1861–65; Andrew Johnson, 1865, Mar. 4—Apr. 16; Schuyler Colfax, 1869–73; Henry Wilson, 1873, Mar. 4—1875, Nov. 22; William A. Wheeler, 1877–81; Chester A. Arthur, 1881, Thomas A. Hendricks, 1885; Levi P. Morton, 1889-93; Adlai E. Stevenson, 1893-97; Garret A. Hobart, 1897-99; Theodore Roosevelt, 1901- . See POLITICAL PARTIES IN THE UNITED STATES.

The pres. and vice-pres. are elected by electors chosen in each state by popular vote, the number being equal to the number of congressmen and senators apportioned to the several states after each census. See PRES. and VICE-PRES., ELECTION OF.

The pres. is assisted in discharge of his duties by a cabinet or council, comprising the secretaries of state, treasury, war, navy, post-office, interior, justice, agriculture, and commerce and labor; and to facilitate official business each of these departments is subdivided into numerous bureaus, whose chiefs report directly to the secretaries, and they in turn to the pres. The secretaries hold office during the pleasure of the pres., generally through his term; and receive each $8,000 per annum: see SECRETARIES OF EXECUTIVE DEPARTMENTS.

The legislative authority is vested in a congress consisting of a senate and a house of representatives. Each state is entitled to two senators, who are elected by the state legislatures for terms of six years. A legal candidate for senator must be 30 years old, a citizen of the U. S. for 9 years, and a citizen of the state in which he is a candidate. The number of representatives to which each state is entitled is fixed by congressional apportionment, based on the population enumeration. By the census of 1880, the ratio of representation was fixed at 151,911, and 1883, Mar. 4, the house comprised 325 representatives. The census of 1900 raised the ratio to 194,182, and 1903, Mar. 4, the house comprised 447 representatives, apportioned as follows: Ala. 11; Ark. 8; Cal. 8; Colo. 4; Conn. 6; Del. 3; Fla. 4; Ga. 13; Ida. 3; Ill. 24; Ind. 15; Ia. 13; Kan. 10; Ky. 13; La. 8; Me. 6; Md. 8; Mass. 15; Mich. 14; Minn. 9; Miss. 9; Mo. 17; Mont. 3; Neb. 8; Nev. 3; N.H. 4; N.J. 10; N. Y. 36; N. C. 11; N. D. 3; O. 23; Or. 4; Penn. 32; R.I.

4; S. C. 9; S. D. 4; Tenn. 12; Tex. 15; Utah, 3; Vt. 4; Va. 12; Wash. 4; W. Va. 6; Wis. 12; and Wyo. 3. Representatives are elected directly by the people, for terms of two years, and senators and representatives receive $5,000 each per annum. A legal candidate for representative must be 25 years old, a citizen of the U. S. for 7 years, and a citizen of the state in which he is a candidate. Vacancies in the senate are filled by appointments by the governors, pending election by the legislatures at their next ensuing session; and vacancies in the house by special elections in the districts in which the vacancies occur. The vice-pres. of the U. S. is pres. pro tem. of the senate; the speaker of the house is a member elected by his fellow-members. The senate has the sole power of confirming or rejecting certain nominations to office by the pres., and of approving or rejecting treaties; and the house has the sole power of originating legislation involving raising and expending money. In cases of impeachment, the house prepares the articles and prosecutes them, and the senate sits as a court, the chief-justice of the U. S. supreme court presiding in the case of the impeachment of the president. Each house of congress makes its own rules, but neither may adjourn for more than three days without the consent of the other.

The judicial authority is vested in a supreme court, consisting (1903) of a chief-justice, salary $10,500 per annum, eight associate justices, salary each $10,000 per annum; in 9 circuit courts, salary of judges $6,000 each per annum; in 83 district courts, salary of judges $3,000-$5,000 each per annum; in 7 territorial courts, with a chief-justice and two to four associate judges each—excepting Alaska and Ind. Terr., which had one judge each—salary of judges $3,000 each per annum; in a court of claims, with one chief-justice and four associate judges, salary of each $4,500 per annum; and in a supreme court of the District of Columbia, with a chief-justice, salary $4,500 per annum, and five associate judges, salary of each $4,000; a court of appeals of the District of Columbia, with a chief justice and 5 associate justices; and a U. S. court of private land claims, with a chief justice anh four associate justices. Judges of U. S. courts who, after servin 10 years and reaching the age of 70 years, resign their office, are entitled to full salary for life.

The District of Columbia is under the direct jurisdiction of the congress: the territories have a special form of govt., with officers appointed by the pres. of the U. S. In general the states are governed after the manner of the general govt., the gov. corresponding to the pres., the legislature in two branches to the congress, and the courts of one to those of the other. For differences and details in the govt. of the states, see their respective titles.

Population.—(1790) white 3,172,006, free colored 59,527, slave 697,681, total 3,929,214; (1800) white 4,306,446, free colored 108,435, slave 893,602, total 5,308,483; (1810) white

5,862,073, free colored 186,446, slave 1,191,362, total 7,239,-881; (1820) white 7,862,166, free colored 233,634, slave 1,538,022, total 9,633,822; (1830) white 10,537,378, free colored 319,599, slave 2,009,043, total 12,866,020; (1840) white 14,195,805, free colored 386,293, slave 2,487,355, total 17,069,453; (1850) white 19,553,068, free colored 434,495, slave 3,204,313, total 23,191,876; (1860) white 26,-922,537, free colored 488,070, slave 3,953,760, total 31,443,-321; (1870) white 33.589,377, colored 4,880,009, total 38,-558,371; 1880)—excluding Alaska and Ind. Terr. 50,-155,783; (1890) 62,885,548; (1900) 76,303,387.

The centres of population as determined by the censuses were: (1790) 39° 16′·5 n. lat., 76° 11′·2 w. long., about 23 m. e. of Baltimore; (1800) 39° 16′·1 n. lat., 76° 56′·5 w. long., 18 m. w. of Baltimore; (1810) 39° 11′·5 n. lat., 77° 37′·2 w. long., 40 m. n.-by-w. of Washington; (1820) 39° 5′·7 n. lat., 78° 33′ w. long., 16 m. n. of Woodstock, Va.; (1830) 38° 57′·9 n. lat., 79° 16′·9 w. long., 19 m. w.s.w. of Moorefield, W. Va.; (1840) 39° 02′ n. lat., 80° 18′ w. long., 16 m. s. of Clarksburg, W. Va.; (1850) 38° 59′ n. lat., 81° 19′ w. long., 23 m. s.e. of Parkersburg, W. Va.; (1860) 39° 04′ n. lat., 82° 48′·8 w. long., 20 m. s. of Chillicothe, O.; (1870) 39° 12′ n. lat., 83° 35′·7 w. long., 48 m. e.-by-n. of Cincinnati, O.; (1880) 39° 4′·1 n. lat., 84° 39′·7 w. long., 8 m. w.-by-s. of Cincinnati; (1890) 39° 11′ 56″ n. lat., 85° 32′ 53″ w. long., 20 m. e. of Columbus, Ind.; (1900) 39° 9′ .5 n. lat., 85° 48′ .9 w. long., 6 m. s.e. of Columbus, Ind.

The following table shows the distribution of population by states and territories 1880 and 1890:

1900			1890			Increase.
State.	Pop.	Rank.	State.	Pop.	Rank.	
N. Y.....	7,268,894	1	N. Y.....	5,997,853	1	1,265,257
Penn.....	6,302,115	2	Penn.....	5,258,014	2	1,044,020
Ill.....	4,821,550	3	Ill.....	3,826,351	3	955,199
O.....	4,157,545	4	O.....	3,672,316	4	485,229
Mo.....	3,106,665	5	Mo.....	2,679,184	5	427,481
Tex.....	3,048,710	6	Mass.....	2,238,943	6	813,187
Mass.....	2,805,346	7	Tex.....	2,235,523	7	566,403
Ind.....	2,516,462	8	Ind.....	2,192,404	8	324,056
Mich.....	2,420,982	9	Mich.....	2,093,889	9	327,093
Ia.....	2,231,853	10	Ia.....	1,911,896	10	319,572
Ga.....	2,216,331	11	Ky.....	1,858,635	11	378,978
Ken.....	2,147,174	12	Ga.....	1,837,353	12	288,539
Wis.....	2,069,042	13	Tenn.....	1,767,518	13	376,036
Tenn.....	2,020,616	14	Wis.....	1,686,880	14	256,098
N. C.....	1,893,810	15	Va.....	1,655,980	15	275,863
N. J.....	1,883,669	16	N. C.....	1,617,947	16	438,736
Va.....	1,854,184	17	Ala.....	1,513,017	17	198,204
Ala.....	1,828,697	18	N. J.....	1,441,933	18	315,680
Minn.....	1,751,394	19	Kan.....	1,427,096	19	440,160
Miss.....	1,551,270	20	Minn.....	1,301,826	20	261,670
Cal.....	1,485,053	21	Miss.....	1,289,600	21	274,049
Kan.....	1,470,495	22	Cal.....	1,208,130	22	41,373
La.....	1,381,625	23	S. C.....	1,151,149	23	263,038
S C.....	1,340.316	24	Ark.....	1,128,179	24	189,167
Ark.....	1,311,564	25	La.....	1,118,587	25	183,385
Md.....	1,188,044	26	Neb.....	1,058,910	26	145,654

1900.			1890.			Increase.
State.	Pop.	Rank.	State.	Pop.	Rank.	
Neb.	1,066,300	27	Md.	1,042.390	27	7,390
W. Va.	958,800	28	W. Va.	762,794	28	196,006
Conn.	908,420	39	Conn.	746,258	20	162,162
Me.	694,466	30	Me.	661,086	30	33,380
Colo.	539,700	31	Colo.	412.198	31	126,357
Fla.	528,542	32	Fla.	391,422	32	137,120
Wash.	518,103	33	N. H.	376,530	33	162,396
R. I.	428,556	34	Wash.	349.390	34	83,050
Or.	413,536	35	R. I.	345,506	35	95,997
N. H.	411,588	36	Vt.	332,422	36	35,058
S. D.	401,570	37	S. D.	328,808	37	55,079
Okla.	398,331	38	Or.	313,767	38	320,407
Ind. Terr.	392,060	39	D. C.	230,392	39	.....
Vt.	343,641	40	Utah.	207,905	40	11,219
N. D.	319,146	41	Ind. Terr.	182,984	41	129,520
D. C.	278,718	42	N. D.	182,719	42	48,326
Utah.	276,749	43	Del.	168,493	43	67,047
Mont.	243,329	44	N. Mex.	153,593	44	99,400
N. Mex.	195,310	45	Mont.	132,159	45	37,854
Del.	184,735	46	Ida.	84,385	46	16.242
Ida.	161,772	47	Okla.	61,834	47	74,762
Hawaii.	154,001	48	Wyo.	60,705	48	.....
Ariz.	122,931	49	Ariz.	59,620	49	40,550
Wyo.	92,531	50	Nev.	45,761	50	29,865
Alaska.	63,592	51	Alaska.	21,929	51	.....
Nev.	42,335	52	Scattered Indians.	53,385	.....	5,099
	10,138,762			62,885,548		

The following table shows the 50 most populous cities 1900, their population 1880, and the increase:

Cities.	1900		Increase.
	Rank.	Population.	
New York, N. Y.	1	3,437,202	1,921,901
Chicago, Ill.	2	1,698,575	598,725
Philadelphia, Pa.	3	1,293,697	246,733
St. Louis, Mo.	4	575,238	123,468
Boston, Mass.	5	560,892	112,415
Baltimore, Md.	6	508,957	74,518
Cleveland, Ohio.	7	381,768	120,415
Buffalo, N, Y.	8	352,387	96,723
San Francisco, Cal.	9	342,782	43,785
Cincinnati, Ohio.	10	325,902	28,994
Pittsburgh, Pa.	11	321,616	82'999
New Orleans, La.	12	287,104	45,065
Detroit, Mich.	13	285,704	79,828
Milwaukee, Wis.	14	285,315	80,847
Washington, D. C.	15	278,718	48,327
Newark, N. J.	16	246,070	64,240
Jersey City, N. J.	17	206,433	43,430
Louisville, Ky.	18	204,731	43,602
Minneapolis, Minn.	19	202,718	37,980
Providence, R. I.	20	175,597	43,451
Indianapolis, Ind.	21	169,164	63,728
Kansas City, Mo.	22	163,752	13,102

Cities.	1900		In-crease
	Rank.	Population.	
St. Paul, Minn	23	163.065	29,909
Rochester, N. Y	24	162,608	28,712
Denver, Col	25	133,859	27,146
Toledo, Ohio	26	131,822	50,388
Allegheny, Pa	27	129,896	24,609
Columbus, Ohio	28	125,560	32,410
Worcester, Mass	29	118,421	33.766
Syracuse, N. Y	30	108,374	20,231
New Haven, Ct	31	108,027	26,729
Paterson, N. J	32	105,171	26,824
Fall River, Mass	33	104,863	30,465
St. Joseph, Mo	34	102,979	50,655
Omaha, Neb	35	102,555	37,897
Los Angeles, Cal	36	102,479	52,084
Memphis, Tenn	37	102,320	37,825
Scranton, Pa	38	102,026	26,811
Lowell, Mass	39	94,969	17,273
Albany, N. Y	40	94,151	* 772
Cambridge, Mass	41	91,886	21,858
Portland, Ore	42	90,426	44,041
Atlanta, Ga	43	89,872	24,339
Grand Rapids, Mich	44	87,565	27,287
Dayton, Ohio	45	85.333	24,113
Richmond, Va	46	85,050	3,662
Nashville, Tenn	47	80,865	4,697
Seattle, Wash.	48	80,671	37,834
Hartford, Ct	49	79,850	26,620
Reading, Pa	50	78,961	20'300

The increase in the number of cities and in their population 1790-1900 is shown in the following:

Year.	8,000 to 12,000.	12,000 to 20,000.	20,000 to 40,000.	40,000 to 75,000.	75,000 to 125,000.	125,000 to 250,000.	250,000 to 500,000.	500,000 to 1,000,000.	1,000,000 and above.	Total
1790	1	3	1	1	....	....	....	....	....	6
1800	1	....	3	2	....	....	....	....	....	6
1810	4	2	3	....	2	....	....	....	....	11
1820	3	4	2	2	2	....	....	....	....	13
1830	12	7	3	1	1	2	....	....	....	26
1840	17	11	10	1	3	1	1	....	....	44
1850	36	20	14	7	3	3	1	1	....	85
1860	62	34	23	12	2	5	1	2	....	141
1870	92	63	39	14	8	3	5	2	....	226
1880	110	76	55	21	9	7	4	3	1	286
1890	173	105	91	35	14	14	7	1	3	443
1900	157	147	116	38	24	13	9	3	3	510

POPULATION BY SEX, NATIONALITY, AND COLOR, 1900.

States and Territories.	Total Population.	Sex,		Native & Foreign born		Native White.			Foreign White.	Total Colored.
		Male.	Female.	Native.	Foreign.	Total.	Native Parents.	Foreign Parents.		
The United St's	76,303,387	39,059,242	37,244,145	65,843,302	10,460,085	56,740,739	41,053,417	15,687,322	10,250,063	9,312,585
No. Atlantic Div	21,046,695	10,524,877	10,421,818	16,283,899	4,762,796	15,898,900	9,917,689	5,981,211	4,762,988	408,807
Maine.....	694,466	350,995	343,471	601,136	93,330	599,291	493,082	106,209	92,935	2,240
New Hamps're	411,588	205,379	206,209	323,481	88,107	322,830	242,614	80,216	87,961	797
Vermont.....	343,641	175,138	168,503	298,894	44,747	298,077	225,380	72,696	44,694	870
Massachusetts	2,805,346	1,367,474	1,437,872	1,959,022	846,324	1,929,650	1,032,264	897,386	840,114	35,582
Rhode Island.	428,556	210,516	218,040	294,037	134,519	285,278	144,986	140,292	133,772	9,506
Connecticut ..	908,420	454,294	454,126	670,210	238,210	655,028	372,783	282,245	237,396	15,996
New York....	7,268,894	3,614,780	3,654,114	5,368,469	1,900,425	5,207,358	2,851,513	2,415,845	1,889,523	112,013
New Jersey...	1,883,669	941,760	941,909	1,451,785	431,884	1,382,267	825,973	556,294	430,050	71,352
Pennsylvania.	6,302,115	3,204,541	3,097,574	5,316,865	985,250	5,159,121	3,729,093	1,430,028	982,543	160,451
So. Atlantic Div	10,443,480	5,222,595	5,220,885	10,227,450	216,030	6,497,175	6,107,314	389,861	208,883	3,737,198
Delaware.....	184,735	94,158	90,577	170,925	13,810	140,248	118,029	22,219	13,729	30,758
Maryland.....	1,188,044	589,275	598,769	1,094,110	93,934	859,280	680,049	179,231	93,144	235,620
Dist. of Colum.	278,718	132,004	146,714	258,599	20,119	172,012	134,073	37,939	19,520	87,186
Virginia	1,854,184	925,897	928,287	1,834,723	19,461	1,173,787	1,141,213	32,574	19,068	661,329
West Virginia	958,800	499,242	459,558	936,349	22,451	892,854	843,981	48,873	22,379	43,567
No. Carolina..	1,893,810	938,677	955,133	1,889,318	4,492	1,259,209	1,250,811	8,398	4,394	630,207
So. Carolina..	1,340,316	664,895	675,421	1,334,788	5,528	552,436	540,766	11,670	5,371	782,509
Georgia.....	2,216,331	1,103,201	1,113,130	2,203,928	12,403	1,169,273	1,144,360	24,913	12,021	1,034,813
Florida.....	528,542	275,246	253,296	504,710	23,832	278,976	254,032	24,044	19,257	231,209
No. Central Div	25,273,004	13,592,322	12,743,682	22,174,530	4,158,474	21,624,738	14,148,919	7,475,549	4,151,372	589,570
Ohio	4,157,545	2,105,655	2,054,890	3,698,811	458,734	3,602,304	2,651,440	950,864	457,900	97,341
Indiana.....	2,516,462	1,285,404	1,231,058	2,374,341	142,121	2,316,641	1,952,104	364,447	141,861	57,960
Illinois	4,821,550	2,472,782	2,348,768	3,854,803	966,747	3,770,238	2,271,765	1,498,473	964,635	86,677
Michigan	2,420,982	1,248,905	1,172,077	1,879,329	541,653	1,858,637	1,026,714	831,653	540,196	22,419

POPULATION BY SEX, NATIONALITY, AND COLOR, 1900.

States and Territories.	Total Population.	Sex.		Native & Foreign born		Native White.			Foreign White.	Total. Colored.
		Male.	Female.	Native.	Foreign.	Total.	Native Parents.	Foreign Parents.		
Wisconsin	2,069,042	1,067,562	1,001,480	1,553,071	575,971	1,542,206	585,903	956,303	515,705	43,567
Minnesota.....	1,751,394	932,490	818,904	1,247,076	505,318	1,232,101	425,780	806,321	504,935	14,358
Iowa.....	2,231,853	1,156,849	1,075,004	1,925,933	305,920	1,912,885	1,261,068	651,817	305,752	13,186
Missouri.....	3,106,665	1,595,710	1,510,955	2,890,286	216,379	2,729,068	2,204,874	524,194	215,775	161,822
North Dakota.	319,146	177,493	141,653	206,055	113,091	199,122	65,811	133,311	112,590	7,434
South Dakota.	401,570	216,164	185,406	313,062	88,508	292,385	136,191	156,194	88,329	20,856
Nebraska.....	1,006,300	564,592	591,708	888,953	177,347	878,409	553,524	325,885	177,117	9,774
Kansas	1,470,495	768,716	701,779	1,343,810	126,685	1,289,742	1,013,655	276,087	126,577	54,176
South Cent'l Div	13,687,987	6,972,970	6,715,017	13,335,190	352,797	9,164,326	8,467,071	697,255	348,906	4,174,755
Kentucky	2,147,174	1,090,227	1,056,947	2,096,925	50,249	1,812,176	1,673,413	138,765	50,133	284,865
Tennessee	2,020,616	1,021,324	999,392	2,002,870	17,746	1,522,600	1,481,636	40,964	17,586	480,430
Alabama	1,828,697	916,764	911,933	1,814,105	14,592	986,814	956,658	30,156	14,338	827,545
Mississippi....	1,551,270	781,451	769,818	1,543,289	7,981	633,575	614,067	19,508	7,625	910,070
Louisiana	1,381,625	694,733	686,892	1,328,722	52,903	677,759	569,962	107,797	51,853	652,013
Texas.....	3,048,710	1,578,900	1,469,810	2,869,353	179,357	2,249,088	1,959,762	289,326	177,581	622,041
Oklahama....	398,331	214,359	183,972	383,651	15,680	351,920	313,905	38,015	15,604	30,807
Arkansas.....	1,311,564	675,312	636,252	1,297,275	14,289	930,394	897,668	32,726	14,186	366,984
Western Div...	4,091,349	2,297,672	1,793,617	3,245,028	346,321	3,112,616	1,720,722	1,091,894	760,852	217,881
Montana.....	243,329	149,842	93,487	176,262	67,067	163,910	92,937	70,973	62,373	17,046
Wyoming.....	92,531	58,184	34,347	75,116	17,415	72,469	47,982	24,487	16,582	3,480
Colorado.....	539,700	295,332	244,368	448,545	91,155	438,571	311,335	127,236	90,475	10,654
New Mexico..	195,310	104,228	91,082	181,685	13,625	166,946	149,029	17,917	13,261	15,103
Arizona.....	122,931	71,795	51,136	98,698	24,233	70,508	44,830	25,678	22,395	30,028
Utah.....	276,749	141,687	135,062	222,972	53,777	219,661	104,026	115,635	52,804	4,284
Nevada.....	42,335	25,603	16,732	32,242	10,093	26,824	15,111	11,713	8,581	6,930
Idaho.....	161,772	93,367	68,405	137,168	24,604	132,605	89,851	42,754	21,890	7,277
Washington ..	518,103	304,118	213,925	406,739	111,364	394,179	265,068	129,111	102,125	21,799
Oregon.....	413,536	232,985	180,551	347,788	65,748	340,721	256,125	84,596	53,861	18,954
California.....	1,485,053	820,531	664,522	1,117,813	367,240	1,086,222	644,428	441,794	316,505	82,326

UNITS, SCIENTIFIC: certain dimensions or quantities assumed as standards of measurement in scientific calculations: these are assigned in various departments. Some typical units are here noticed.

PHYSICAL AND MECHANICAL UNITS. — Fundamental scientific units, according to the system adopted by the Brit. Assoc., are based on three quantities, the *centimetre* (unit of length or space), the *gram* (unit of mass), and the *second* (unit of time): the system is named from these three terms, the C. G. S. system. The gram in this case represents the mass of one cubic centimetre of water, really 1·000013 gram. As every scientific unit is based on one or more of the factors of space, mass, and time, it is evident that its value regarded as a quality may be expressed in terms of one or more of them. For these purposes the symbols L for lineal space, M for mass, and T for time, are used. The expression of a quality in terms of L, M, and T gives its dimensions, and has no reference to its absolute size: thus the dimensions of a second or of an hour are the same, namely, the dimensions of time, T. But if for these symbols we substitute the centimetre, the gram, and the second, the dimensions give us the concrete values of any desired fundamental unit. The three fundamental bases of space, mass, and time being given, we may deduce therefrom other units.

Velocity is space traversed divided by the time required in traversing it. Its dimensions are L/T; the C. G. S. unit is one centimetre per second.

Momentum is mass multiplied by velocity: its dimensions are $M \times L/T$, or ML/T; the C. G. S. unit is one gram moving at the rate of one centimetre per second.

Acceleration is velocity acquired (or lost) in a second: its dimensions are $L/T \div T$, or L/T^2; its C. G. S. unit is one centimeter per second.

Force is mass multiplied by acceleration: its dimensions are $M \times L/T^2$, or ML/T^2; its C. G. S. unit is the force required to impart a velocity of one centimetre per second to a mass of one gram. It is termed the *dyne;* approximately equal to $\frac{1}{981}$ gram.

Energy is force exercised along a path in space: its dimensions are $ML/T^2 \times L$, or ML^2/T^2; its C. G. S. unit is the dyne-centimetre or erg—approximately equal to $\frac{1}{13562691}$ foot-pounds.

Work is identical with energy in its dimensions and units.

Density is the quantity of matter per unit of volume: its dimensions are mass ÷ volume or M/L^3; unitary density is that of distilled water at 3°·9 C.

Activity or *Power* is the quantity of work done per unit of time: its dimensions are $ML^2/T^2 \div T$, or ML^2/T^3; its C. G. S. unit is the *erg-second.*

The foregoing illustrates the *theory of dimensions* of fundamental or C. G. S. units. There are many other scientific units which may be termed practical units, of which the following are representative.

Thermal units are generally expressed in weight of water

raised one degree in temperature. Under this head are such units as the gram-degree C., the kilogram-degree C., the pound-degree C., or the pound-degree F.—indicating the quantity of heat required to raise the temperature of one gram of water one degree Centigrade, from 0° to 1°, and so on. The gram-degree C. is termed the 'smaller calorie;' the kilogram-degree C. is the 'calorie' proper.

Work and energy units are generally expressed in weight raised a certain height. Of this class are the kilogram-metre, the foot-pound, the gram-centimetre, etc. The last-named, a gram raised one centimetre, would be a C. G. S. unit, except that the erg is accepted in its place.

Power, Activity, Rate of doing work or Rate of expending energy, all which are virtually synonymous, are generally expressed in horse-power. The Brit. and Amer. horse-power is 33,000 lbs. raised one foot per minute.

These units may be reduced from one to the other among themselves by multiplying by the requisite factors. The classic factor is known as Joule's equivalent. He determined that one pound-degree F. was equal to 772 foot-pounds of mechanical energy: this constant is one expression for the mechanical equivalent of heat. The mechanical equivalent of heat may be expressed in other units: thus one gram-degree C. is equal to 42,353·5 gram-centimetres.

Thermo-chemical equivalents are the products of the chemical combining weights of substances by the kilogram-degree C. of heat produced by the combination of one gram of the substance in question.

Electro-chemical equivalents are the quantities of substances decomposed by one coulomb of electricity.

Electrical Units.—There are two classes of electrical units based on the C. G. S. system. One is called the *electro-static* class, of principally theoretical interest, based on the forces exerted between two quantities of electricity. The other is called the *electro-magnetic*, based on the forces exerted between two magnetic poles. The latter is the basis for the electrical units adopted by the Paris Congress of Electricians, 1871. There are five principal units, called C. G. S. units of resistance, units of electro-motive force, etc. Being unsuited for practical use, multiples of them are used in practice, and are called *practical units*. We describe here only the electro-magnetic units.

The C. G. S. unit of Current Strength is the strength of a current which, passing through a circuit one centimetre long, bent into the form of the arc of a circle of one centimetre radius, exerts a force of one dyne on a unit magnetic pole placed at the centre of the circle.

The C. G. S. unit of Quantity is equal to a current of one C. G. S. unit of strength lasting for one second.

The C. G. S. unit of Electro-motive Force (often written E. M. F.) is one by which, if a C. G. S. unit of quantity is multiplied, one erg will be produced.

The C. G. S. unit of Resistance is one which requires one C. G. S. unit of E. M. F. to produce in it one unit of current strength.

The C. G. S. unit of Capacity is possessed by a con-

denser when it will hold one C. G. S. unit of quantity when charged to one unit of E. M. F. potential.

The practical units are multiples of these. The following are their names and relations to C. G. S. units:

The unit of CURRENT STRENGTH is called the *Ampere:* it is equal to $\frac{1}{10}$ C. G. S. unit. It is produced by an E. M. F. of 10^8 C. G. S. units (1 volt) acting through a resistance of 10^9 C. G. S. units (1 ohm).

The unit of QUANTITY is called the *Coulomb:* it is equal to $\frac{1}{10}$ C. G. S. unit; and is equal to one ampere lasting for one second.

The unit of E. M. F. is called the *Volt:* it is equal to 10^8 C. G. S. units; and is equal to producing a current of one ampere through a resistance of one ohm.

The unit of RESISTANCE is called the *Ohm:* it is equal to 10^9 C. G. S. units. One volt acting through it produces one ampere of current.

The unit of CAPACITY is called the *Farad:* it is equal to $1 \div 10^9$ C. G. S. units; and it is the capacity of a condenser, which, charged to a potential of one volt, will contain one coulomb of electricity.

To make the above more intelligible, the concrete representations of some may be cited. A single cell of Daniell battery gives an E. M. F. of 1·07 volt. A current of one *ampere* strength decomposing water, disengages 0·172 cubic centimetres of hydrogen and oxygen at 0° C. and 760 mm. barom. per second: this quantity represents, therefore, one *coulomb.* The *ohm* is represented very nearly by the resistance of a column of mercury one sq. millimeter in section, and 106·24 centimetres in length.

Compound units also may be made up from the above. The principal one, the *volt-ampere,* often called the *watt,* is a convenient and much-used unit of power or rate of work: 746 watts are equal to one horse-power.

Many other units of inductance and of other qualities are used; and there is a disposition to introduce new ones. The above are the principal ones, however, and answer nearly all purposes. By placing *meg-* or *mega-* before a unit it is multiplied by 10^6, or one million (meg-ohm = one million ohms). In like manner *myria-* multiplies by 10^4, or ten thousand; *kilo-* by 10^3, or one thousand; *milli-* divides by 10^3, and *micro-*, or *micr-*, divides by 10^6.

UNIVALENT, a. *ū-nĭv'ă-lĕnt* [L. *ūnus,* one; *valens* or *valen'tem,* having strength; *valērĕ,* to have strength]: in *chem.*, applied to an element whose atom is supposed to have only one combining power (see VALENCY).

UNIVALVE, n. *ū'nĭ-vălv* [L. *ūnus,* one; *valvæ,* the folds or leaves of a door]: a shell consisting of a single piece, such that of the snail, periwinkle, limpet, and other gasteropodous mollusks (see GASTEROPODA: MOLLUSCA): ADJ. having one valve or piece only. U'NIVAL'VULAR, a. *-vū-lĕr,* or U'NIVALVED, a. *-vălvd,* having one valve only.

UNIVERSAL, a. *ū'nĭ-vĕr'săl* [L. *unĭversālis*, belonging to all, universal—from *univer'sus*, whole—from *ūnus*, one; *versus*, pp of *verto*, I turn]; embracing or comprehending the whole; general; all; comprising all the particulars: N. in *logic*, a general abstract conception applicable to each individual or species contained under it. U NIVER'SALLY, ad. *-lĭ*, in a manner to comprehend all. U'NIVERSAL'ITY, n. *-săl'ĭ-tĭ*, state of extending to the whole; unlimited application or extent; also U'NIVER'SALNESS, n. *-nĕs*. U'NIVER'SALISM, n. *-săl-ĭzm*, the doctrines or beliefs of the Universalists. U'NIVER'SALIST, n. *-ĭst*, one who holds the doctrine that all men will be saved finally. UNIVERSAL JOINT, a joint on the principle of the ball-and-socket joint, which can be moved in any direction.

UNIVERSALISTS, *ū-nĭ-vĕr'săl-ĭsts:* sect of Christians whose distinctive peculiarity consists in their belief that all erring or sinful beings will ultimately be brought back to God through the irresistible efficacy of His love manifested and applied through Christ. The ground of their faith in the final salvation of all men is not so much any specific and direct assertions of Scripture to that effect as it is a rational deduction from the whole spirit and design of the gospel. They argue that when an infinitely wise, holy, and benevolent God resolved to create man, it must have been with a view to man's everlasting good; that if God allowed man to be tempted and fall, it must have been because He foresaw that through sorrow and suffering man could rise to higher degrees of perfection; that therefore all punishment (or what, with our limited knowledge, we conceive to be such) is of necessity designed as a remedial agent, and not to satisfy God's indignation as a sovereign at the disobedience of His subjects; that no other view of the subject is compatible with the New Test. representation of God as a 'Father,' or with the oft-repeated declaration (in various terms) that Jesus Christ was a propitiation for the sins of the whole world. In answer to those who adduce against them the express words of the Lord Jesus in various passages (e.g., Matt. xxv. 46), 'These shall go away into eternal punishment: but the righteous into eternal life,' they reply that the word *aiōnios*, translated 'eternal' or 'everlasting,' does not necessarily bear that signification; that properly it does not express the idea of duration at all, either finite or infinite, but was used by the sacred writers rather to denote a mode of existence distinct from and wholly dissimilar to any mere *chronic* state or state of being in *time;* in proof of which they point to such passages as—'*This is life eternal*, that they might know Thee, the only true God, and him whom Thou didst send, even Jesus Christ' (Jn. xvii. 3), where eternal life is affirmed to be *knowledge*—a present disposition of mind and heart toward God in Christ, and not a perpetual hereafter of duration.

U. generally differ from the prevalent bodies of Christians in other important doctrines, though such differences are no essential part of Universalism. Most of the U. agree with Unitarians in rejecting the standard doctrine of the Trinity; but there are eminent examples to the contrary;

and they in general do not engage largely in discussions of Christ's nature—rather ascribing to him the highest honor as the one sufficient Saviour sent forth from God. Mostly they are Pelagian in regard to original sin, and reject the notion that the new birth is something supernatural: see PELAGIANISM.

Universalism as a mode of belief is of very ancient origin; and its modern adherents, besides urging its congruity with the divine plan of redemption, as revealed in Scripture, point to the earliest Christian writings—citing passages in favor of the doctrine from many of the church Fathers—Clemens Alexandrinus; Origen; Marcellus of Ancyra; Titus of Bostra; Gregory of Nyssa; Didymus the Blind; Diodorus of Tarsus; Theodore of Mopsuestia; and Victorinus. The doctrine in general is said to have been held by some of the Albigenses, Waldenses, Lollards, and Anabaptists, and it probably had isolated supporters in most of the countries into which the Reformation penetrated. It has had some illustrious sympathizers in the Church of England and among English Nonconformists: among these it is usual somewhat loosely to rank Tillotson, Burnet, Newton, Henry More, Whiston, Jeremy White, Soame Jenyns, David Hartley, William Law, De Quincey, and F. D. Maurice. The same remark is applicable to the French Prot. and German churches; and indeed in all ages a certain class of minds in the church has been disposed toward a hope of some possible universal restoration to holiness and happiness of all fallen intelligences, whether human or angelic. This vague hope—variously traceable to reasoning or to sentiment—is in recent years increasingly manifest in almost all denominations; and its right to exist is not now usually denied in those denominations, so long as it remains an indefinite hope, and does not proceed to any distinct assertion of universal salvation as a doctrine of the Christian faith. It is felt that the proper place for those who make this a *doctrine* is with the Universalists.

The existence of U. as a distinct religious sect is a feature of American rather than of English religious society. The existing denomination of U. dates from the latter half of the 18th c. An English preacher, John Murray, came to America 1770, and began promulgating doctrines later identified with Universalism. He addressed assemblages in various towns along the Atlantic coast from N. J. to Mass. Churches were founded in various places (notably one in Gloucester, Mass.), and ministers installed: there were about 20 ministers in fellowship with Murray 1800. About that time, Hosea Ballou, the real 'father of Universalism' in the United States, was rising to prominence. His teaching found expression in the Profession of Belief adopted by a general convention at Winchester, N. H., 1803. The profession was as follows:

'Art. I. We believe that the Holy Scriptures . . . contain a revelation of the character of God, and of the duty, interest, and final destination of mankind.

'Art. II. We believe that there is one God, whose nature is love, revealed in one Lord Jesus Christ, by one Holy

Spirit of grace, who will finally restore the whole family of mankind to holiness and happiness.

'Art. III. We believe that holiness and true happiness are inseparably connected, and that believers ought to be careful to maintain order, and practice good works; for those things are good and profitable unto men.'

In the several states of the Union, the Universalist churches hold conventions with lay and clerical members as delegates from the local churches. The general convention meets biennially, and is composed of the presidents and secretaries of the state conventions and of clerical and lay delegates from those conventions—each state being entitled to one clerical and two lay delegates, and to an additional number of each class of delegates proportional to the aggregate of its parishes and clergymen. The general convention has jurisdiction over the ecclesiastical organization of the Universalist Church in the United States and the Canadian provinces, and is the final court of appeal in all cases of dispute between state conventions. It is incorporated; and is empowered to hold real and personal estate to the value of $500,000, exclusively for 'diffusion of Christian knowledge by means of missions, publications, and other agencies.' Its funds aggregated (1896) $271,014. The Woman's Centenary Assoc. (organized 1869) is the women's national missionary society, having its auxiliaries in the several states. The Young People's Christian Union (organized 1889) is a national soc. uniting the local Christian unions of young people for religious, philanthropic, missionary, and reform work.

There were in Canada (1897) 11 churches with 312 members; in Scotland, 2 churches with 95 members; in Japan, 7 churches with 117 members. The U. had in the United States (1897); Parishes, 998, preachers, 789; churches, 805, members 48,501. In 1902 there were 772 churches, 750 ministers, and 52,944 communicants. The denomination maintained 4 colleges, Tufts College (near Boston), St. Lawrence Univ. (Canton, N. Y.), Lombard Univ. (Galesburg, Ill.), Buchtel Coll. (Akron, O.); 3 theol. schools, 5 academies, some of which are unusually well-equipped. The publishing house had net assets (1897) about $195,000.—See Ballou's *Anc. History of Universalism,* and Whittemore's *Modern History.*

UNIVER'SITY: corporation of teachers or students instituted for promotion of the higher education. The prototype of modern universities may be sought in the schools of Isocrates and Plato at Athens, and the Museum at Alexandria. These institutions resembled the U. of after-times, both in their objects and their organization; and in Greece and Rome, as well as in the later Byzantine empire, something analogous to the degree was conferred on those who had successfully passed through the *trivium* or *quadrivium*, which together comprised what were regarded as the seven liberal arts and sciences. The U. is, however, usually considered to have originated in the 12th or 13th c., and to have grown out of the schools attached to most of the cathedrals and monasteries for the education of churchmen and laymen, and for bringing together the few learned and scientific men in Europe. Such an institute of the higher learning was at first called *studium* or *studium generale.* When a teacher of eminence appeared, such as Abelard or Peter Lombard at Paris, or Irnerius at Bologna, a concourse of admiring students flocked round him; and the members of the *studium generale* formed themselves, for mutual support, into a corporation, on which the general name *universitas* came to be bestowed. In this way the oldest universities arose spontaneously. The crowds drawn from every country of Europe to Paris, Bologna, and other educational resorts had first local immunities bestowed on them for encouragement of learning, and to prevent their resorting elsewhere; and the academical societies thus formed were by papal bulls and royal charters constituted an integral part of the church and state. One great difference existed between the constitution of the two most important universities of early times. In Paris, the teachers alone constituted the corporation; in Bologna, the U. consisted of the students or scholars, who at first held the supreme power, and appointed the academic officials. In this respect Bologna became the model of the subsequent universities of Italy and the provincial universities of France, which were corporations of students; while the universities of Great Britain, Germany, Holland, and Scandinavia were, like Paris, corporations of teachers, and the Spanish universities occupied an intermediate position. With a general resemblance, there was much difference in the constitution and character of the pre-Reformation universities, the form of each being the result of a combination of various circumstances and ideas acting on an originally spontaneous convocation of teachers and scholars. (See PARIS: BOLOGNA: ETC.)

The several *faculties* of a U. are subordinate corporations, consisting of the aggregate of students or teachers in a particular department of knowledge. The number of faculties has varied in different universities. The U. of Paris had at first only a faculty of arts, which, as early as 1169, existed as a separate body, with organization of its own. Faculties of theology, medicine, and canon law were added in the 13th c. Bologna was at first exclusively, as it continued pre-eminently, a school of law. Ox-

ford and Cambridge, in their origin, existed only in the faculty of arts. Some of the smaller French universities, as Orleans and Montpellier, were prohibited from teaching theology, lest they should become rivals to Paris. See UNIVERSITY OF FRANCE.

The granting of degrees was the mode in which the U. reproduced itself. A degree is the recognition of a student having made a certain advance in his career, the degree of doctor or master, in its original idea, entitling the person on whom it was conferred to teach within the limits of the U. Toward the end of the 13th c., Pope Nicholas I. granted to the U. of Paris the right of endowing its graduates with the power of teaching everywhere; and this universal degree, making the recipient of it a member of the community of the learned throughout Christendom, became a link of connection between the universities of Europe. The designation of *Bachelor*, borrowed from the term indicating the probationary stage of knighthood, and implying the lowest stage of U. honor, or the condition of an imperfect graduate, was first introduced in the 13th c. in the U. of Paris, where the bachelor, though intrusted with certain tutorial functions, had no legislative power. The right of teaching (*regendi*) belonged to the master, doctor, or other perfect graduate; and a period of necessary regency was generally fixed, during which the graduates were bound to teach, and after the expiry of which they were at liberty to become non-regents. In the course of time it became the practice to endow a select number of the graduates as public authorized teachers; these privileged and salaried graduates were designated *professors*, and instruction by professors more or less supplanted the original plan of teaching by graduates.

The poverty of a proportion of the students, and the desirableness of domestic superintendence, suggested the institution of halls endowed with property and corporate privileges, called *colleges*. Though originally a provision for poor scholars, they soon assumed the character of boarding-houses for all classes of students, where they were privately trained and prepared for the public lectures. Colleges seem to have been introduced first in Paris, where most of them became appropriated to a particular faculty, or department of a faculty. The college of the Sorbonne (q.v.), founded 1250, came to be in a great measure identified with the theological faculty. Regent masters were named by the faculties as lecturers in the colleges, attendance on whom was made equivalent to attendance on the public courses in the schools of the U., and eventually the college lectures were thrown open to all members of the U.; and it became obligatory in the faculty of arts, and usual in the other faculties, to become a member of some college.

The two highest U. officers have generally been the *rector* and the *chancellor*, the former being the head of the U. in everything except the granting of degrees, which are conferred by the latter as the fountain of honor. Besides the division into faculties, there was in most of the

continental universities a division of the graduates and students into *nations*, in respect of the countries to which they belonged. In Paris, the faculty of arts was divided into four nations, French, Picard, Norman, and German or English; and after the 13th c., these four nations under their respective procurators, and the three subsequently added faculties under their deans, constituted the seven component parts of the U. The rector, with the procurators and deans, formed a court having cognizance of all matters relating to discipline, from which there was an appeal to the U., and thence to the parliament of Paris. In Bologna, after faculties of philosophy, medicine, and theology had been added to those of civil and canon law, the students were classed as *ultramontani* and *citramontani*, and each class divided into nations, presided over by their several counselors or procurators.

The U., with modifications according to the altered circumstances of society, has survived the revolutions of seven centuries. At present, Europe has about 100 universities, some dating from the 12th and 13th c., and others of various degrees of antiquity, including some founded in the 19th c. More than 30 belong to Germany and Austria, and 20 to Italy; Holland, Belgium, Scandinavia, Spain, Portugal, Russia, and Greece contain in all about 30 universities. England has five—two ancient, Oxford and Cambridge; three modern, London, Durham, and the Victoria U. Scotland has the five universities of St. Andrews, Glasgow, Aberdeen, Edinburgh, and Dundee; and Ireland has Trinity College, Dublin, and the Queen's (q.v.) University.

Of the universities of Germany, the oldest are Prague, founded 1348, and Vienna 1365. Heidelberg dates from 1386; Leipzig, 1409; Tübingen, 1477; Jena, 1558; Halle, 1694; Göttingen, 1737; Berlin, 1810; and Bonn, 1818. The chief administrative body of the German universities is the Senatus Academicus, composed of the ordinary professors, presided over by a rector elected yearly, or (at Halle and Tübingen) by a chancellor appointed for life, the exercise of discipline being, however, intrusted to a separate court, presided over by a judicial officer called the syndic. There is a recognized gradation in the professorial office. The highest class are *ordinary professors*, generally men of eminence in their respective departments, elected by government out of three candidates submitted by the faculty to which they belong. Next to them are the *extraordinary professors* of the same branches, with smaller salaries; and then the class of *privat-docents*, who, in the course of time, qualify themselves to be extraordinary professors. An ordinary professor must deliver public lectures on the branch to which he is appointed; an extraordinary professor, or privat-docent, may lecture on what subject he pleases. The student is mostly at liberty to attend what lectures he pleases; but licenses to practice certain professions, benefices in the church, and other posts, are given only to persons who have gone through a certain course of U. study. In addition to the above-mentioned

classes of instruction, there are teachers of modern languages and other branches not forming part of the curriculum. The *Bursæ*, foundations resembling in their origin the English colleges, and the *Convikt*, or free table, are institutions for benefit of the poorer students, from the former of which is derived the name *bursche*, popularly applied to a student in Germany. The German U. system is admirably adapted for advancement of science; its deficiency is chiefly in appliances for superintending the progress of the individual student. The professor is often more an instructor of the world at large by his writings, than of his students by his lectures.—For some principal German universities, see titles of their respective towns.

The two great English universities are little inferior in antiquity to Paris and Bologna. From the beginning of the 12th to the middle of the 14th c.. Oxford took nearly as important a part in science and political life as Paris itself, with which it was connected by intimate ties, the most eminent doctors of Oxford acting at the same time as regent-masters in Paris. It espoused the cause of the barons against the crown, and while preserving an intimate relation with the church, generally sided against ecclesiastical abuses. Oxford and Cambridge, though not unlike the continental universities in their origin, developed themselves in a manner peculiar to England. From an early period it was the practice of the students to live in common in halls or hostels, rented from the burghers, under the charge of a common teacher. In 1280 there were 34 halls at Cambridge, some containing 20 to 40 masters of arts, and a proportionate number of younger students. In the course of time, colleges were endowed by benevolent persons for maintenance of the poorer students, and the name *socii*, or *fellows*, was applied to the recipients of the endowments. This assistance was originally meant to last no longer than the completion of the course of study; but as most of the *socii* belonged to the ecclesiastical order, and had no other means of support, an understanding gradually arose that the aid furnished by the college should be continued to the *socius* till he obtained a benefice. These provisions gradually increased in number and importance; and a practice was introduced of the colleges receiving wealthier students as boarders—the origin of the class of commoners or students not on the foundation. Most of the halls fell into decay, and those that remained received a collegiate character. In the 15th c. fellowships were no longer endowed to assist students going through their course of study, but as a permanent provision for poor young men of the clerical order who showed taste for learned pursuits; and the degree of master was made a necessary condition for holding them. In this way the colleges became the U.: the U. acquired a semi-monastic character, which has since more or less adhered to it; and a tutorial system of education within the colleges was almost entirely substituted for instructions by U. professors. For two centuries the staff of professors has had

little to do with academical education or discipline. The instruction of the student is committed to college tutors, assisted by private tutors, and attendance on the professors is in general required neither for U. rank nor for college emoluments. The tutorial system is defended on the ground of its giving the instructor a greater hold over the student's attention. On the other hand it lacks the advantages arising out of the division of labor in the professorial system; and it is now generally allowed that a mixture of both systems of teaching is better than either alone. An effort has been made by the new statutes to render the professorial office in Oxford and Cambridge less of a sinecure than formerly. One of the most remarkable features of the English universities is their wealth in endowments. According to the *Universities Commission Report* (1874), the annual revenue of Oxford and Cambridge amounted to about £750,000, of which endowments provide £614,000. For the mode of government, see CAMBRIDGE, UNIVERSITY OF: OXFORD UNIVERSITY.

Of the three modern English universities, London U. (q.v.) was established by royal charter 1836. It is wholly unlike the older English foundations, and is substantially an examining board, empowered to grant degrees to all persons found qualified, wheresoever their education may have been pursued. Durham (q.v.) U. was opened for students 1833, and obtained the right of conferring degrees by royal charter 1837. The general provisions for education are similar to those of Oxford and Cambridge. The U. has connected with it a medical college and one of natural science in Newcastle. The charter granted to the Victoria U. in 1880 is meanwhile relevant to Owens College (q.v.) only, but contemplates the affiliation of other suitably equipped colleges.

The universities of Oxford and Cambridge have since 1603 returned two members each to parliament; the U. of Dublin has the same privilege; while London U. elects one.

The universities of Scotland approached much more nearly to the type of Germany and the Low Countries than of England. The teaching as well as governing body were the professors. Though nearly all the students were Scotchmen, they were nevertheless divided, according to continental usage, into four nations, named from the parts of Scotland to which they belonged The act of 1858 gave a uniform constitution to all the Scottish universities, each of which has now three governing bodies, the senatus academicus, the university court, and the general council; the chief officers being the principal, the rector, the chancellor, and the vice-chancellor. The universities of Edinburgh and St. Andrews, and the universities of Glasgow and Aberdeen, form two constituencies, each represented by one member of parliament.—For the Scotch Universities, see ABERDEEN: DUNDEE: EDINBURGH, UNIVERSITY OF: GLASGOW, UNIVERSITY OF: ANDREWS, ST.

In Ireland, the U. of Dublin was founded 1591 (see DUBLIN, UNIVERSITY OF): it sends two members to parliament.

The Queen's U. in Ireland, having its seat in Dublin Castle, was founded by royal charter 1850, and empowered to grant degrees to students of the three Queen's Colleges (q.v.) respectively at Belfast, Cork, and Galway. A bill passed 1879, altered its title to the Royal U., and gave it right to grant degrees to all qualified comers. The 'Catholic U. of Ireland,' depending for maintenance largely on voluntary subscriptions, has no state charter, but has several affiliated colleges.

The British colonies have several universities. In Canada numerous institutions claim the title: among the more important are McGill U., Montreal; the U. of Toronto; Dalhousie College, at Halifax in Nova Scotia; and Laval U. in Quebec, a Rom. Cath. institution. Australia has well-equipped universities at Melbourne (founded 1854), Sydney (1852), and Adelaide (1874); New Zealand has one at Dunedin; and Cape Colony has a recently founded but thriving U. at Cape Town. Malta has had a U. at Valetta since 1388. The three universities of India, at Calcutta, Madras, and Bombay, have several affiliated colleges.

Of universities in the United States it is difficult to speak generally, as it is impossible to draw a line between those institutions which may fairly be called universities, and the rest of the multitude of 'universities and colleges' of the govt. reports (see COLLEGE). Of these, some are insignificant or rudimentary, but most of them grant degrees of some sort. There are in the west and southwest many establishments that call themselves universities, though differing as widely as possible in rank, some being of a grade scarcely above academies. The total number of 'universities and colleges' (1901) was 473; with total instruc. 14,908 (of which 3,353 in preparatory, 8,448 in collegiate, 4,278 in professional depts.). total students 169,036 (preparatory 51,183, collegiate 81,084, grad. dept. 6,325, professional 30,441); number scholarships 8,182; vols. in libraries 8,478,624, value of scientific apparatus $17,482,-924; of grounds and buildings $146,168,475; productive funds $157,006,072; total annual income, $22,789,054; benefactions in previous year $17,023,202. In 1901 total number of coll. and univ. in U. S. was 473. U. S. govt. exercises no control over education other than for officers of the army and navy. Some of the schools of higher education have been founded by the particular state in which they stand, and are wholly controlled by the state; some, partly endowed by the state, and to some extent regulated by representatives of the state, are non-sectarian; the numerous sectarian ones are founded and managed by ecclesiastical bodies. Into these three classes the 'universities' may be divided. The best type of college is a corporation with a charter from the state, and supported by endowments, donations, and fees. Its head is called president, generally chosen by trustees; the chief authority is committed to a body of trustees or overseers, some of whom are appointed by the state; while the executive is mainly in the hands of the faculty, consisting of professors and other instructors. The course of study, comprising the chief subjects of a liberal education, extends over four

years. The degree usually conferred at graduation is B.A. Instances of colleges worthy to be regarded as universities are Harvard U. (q.v.), Yale U. (q.v.), Cornell U. (q.v.), Princeton U. (q.v.), U. of Michigan (see MICH., U. OF), Columbia U. (q.v.) in New York, Johns Hopkins U. (q.v.), Northwestern U. (q.v.); see others also under their respective titles. (See NEW YORK (State) for the U. of the State of New York.) Oberlin College (q.v.), Ohio, has long done excellent practical work on an extensive scale. A recent institution of high rank is Clark U., Worcester, Mass. Lake Forest U. (Presb.), near Chicago, is rapidly rising in importance. Two institutions now being founded on the grandest and most comprehensive scale, are Leland Stanford, Jr., U. in Cal., and Chicago U. (under Bapt. control) at Chicago.

See (further) COLLEGE: also the several special titles of important colleges in the United States.

Some of the most ancient and famous European universities are now defunct; e.g., those of Cologne (founded 1388), Erfurt (1392); or incorporated with more recent ones, as Wittenberg.

See Savigny, *Geschichte des Römischen Rechts im Mittelalter;* Von Raumer, *Geschichte der Pädagogik;* Von Sybel, *Die Deutschen und die Auswärtigen Universitäten;* Crevier, *Histoire de l'Université de Paris;* Malden, *History of Universities and Academical Degrees;* Kirkpatrick, *Historically Received Conception of a University;* Huber, *History of English Universities;* Wood, *History and Antiquities of Oxford;* Dyer, *History of the University of Cambridge;* Mullinger, *History of the University of Cambridge;* Hart, *German Universities; Reports of Royal Commissions concerning the Universities of Scotland; Report of Commissioners on Oxford and Cambridge Universities.*

UNIVERSITY COLLEGE, Oxford: oldest college in the Univ. of Oxford, said to have been founded by Alfred the Great 872. It was restored by William of Durham, rector of Wearmouth, who, 1249, left money as permanent endowment for a certain number of 'masters,' preference being given to those born nearest the city of Durham. Among its subsequent benefactors are—King Henry IV., who founded (1403) three fellowships, at the request of Bp. Skirlaw of Durham (who also is ranked as a 'benefactor'); Henry Percy, Earl of Northumberland, three fellowships (1442), Sir Simon Bennet, Bart., four fellowships and four scholarships (1631). In 1714 Dr. John Radcliffe founded 2 fellowships, tenable for 10 years by masters of arts, who must travel abroad during 5 years. The present foundation consists of 1 master, 13 fellows, 12 scholars, and several exhibitioners. The patronage consists of 10 livings.

UNIVERSITY (AND SCHOOL) EXTENSION: scheme for making available to the public, outside of the schools, the benefits of systematic oral or written teaching of the various branches of knowledge. It originated in England with the courses of lectures given by James Stuart to women's clubs in the n. of England about 1867–78, which

proved very popular, and were soon extended to bodies of workingmen. In connection with the lectures there grew up a demand for a class or review hour for answering questions, clearing up difficulties, etc. He soon formulated plans for systematic study in the intervals of the lectures. At Mr. Stuart's suggestion the system was adopted 1873 by the Univ. of Cambridge (of which Mr. Stuart was a fellow and lecturer), which offered to supply the towns of England with instructors in various departments of knowledge under the control of the univ. The system became rapidly and widely popular. In 1876 the London Soc. for the extension of university teaching was founded, and in 1885 the Univ. of Oxford took up the work. The number of lectures in each course was fixed at 10, to be given weekly, and followed in each case by a conference or class. A syllabus giving an outline of the lectures and suggestions for reference, reading, and questions to be answered in weekly papers, soon became part of the system, which concluded its work with an examination graded by univ. standards. After Oxford took up the system, travelling libraries of about 50 books each on the subjects of the respective courses of study, and summer assemblies on the Chautauqua plan, became added features. About 400 centres of U. E. have now been formed in England, and courses are now given with an aggregate attendance of between 60,000 and 80,000 students.

The system was introduced into the U. S. in 1887 by J. N. Larned, supt. of the Buffalo Library, but gained no general acceptance till taken up in 1890 by the Univ. of Pennsylvania, under the lead of Provost William Pepper, who sent Mr. George Henderson to England expressly to study the methods and results of its working there. The American Soc. for the Extension of Univ. Teaching was formed in Philadelphia. Numerous universities and colleges, including Brown, Columbia, Cornell, and Chicago, took up the work, which has now spread to all parts of the country. The celebrated Chautauqua course (see CHAUTAUQUA INSTITUTIONS) is really a form of U. E. work. Under the direction of Edmund J. James, pres. of the American soc., a seminary for the training of U. E. lectures was established in 1893, and summer meetings for U. E. students instituted. For 1900-1, the American soc. for the extension of university teaching reported 95 courses at 74 centers, with total attendance 24,531; in addition to which more than 800 lectures in similar lines were given by various universities and colleges working independently. The total attendance at classes was 10,535. (In these statistics the Chautauqua work is not included.) Magazines in the interest of the movement include *University Extension; The University Extension Journal* (London); in addition to these are the circulars, pamphlets, etc., of the American Soc. (address: University Extension, Fifteenth and Chestnut street, Phila.); circulars on the N. Y. state work may be obtained from Melvil Dewey, Albany, N. Y.

The fees of membership are exceedingly low—viz., for

registration, with one course of 10 lectures or lessons, $1; additional courses, each $1; registration, with 6 syllabuses, $1; additional syllabuses, 20 cts. each, or 6 for $1; registration, with one printed course of lectures, $1; additional printed courses, $1 each; annual membership, with 6 printed courses, $5; annual membership, with 25 lecture or lesson coupons for any course, $5. Liberal provision is made, on similarly reasonable terms, for courses of lectures in all parts of the United States.

UNIVERSITY OF CHICAGO: see CHICAGO, UNIVERSITY OF. [Likewise, for similar Titles.]

UNIVERSITY OF FRANCE: term specifically applied to the whole French governmental system of education as centralized and controlled in one body. In France, since the revolution, the word University has acquired a meaning widely different from that which it bears in other countries—the expression 'Université de France' being nearly equivalent to 'national system of education of France.' All the old universities of the country having been swept away at the Revolution, education had fallen into abeyance. After various attempts at the establishment of primary, secondary, and central schools in the departments, the imperial govt. adopted a new system, by which the whole educational machinery of the country was centralized at Paris, and committed to a body called the University, with a grand-master at its head, assisted by a council. The system has since undergone various alterations. The governing body, as well for higher educational institutes as for elementary schools, is the ministry of public instruction, supported by a supreme educational court and 18 inspectors-general. France is divided into 16 educational districts, called *Academies*, within whose bounds exist one or more of the *Faculties* of theology, law, medicine, and science and literature. Such faculties are found in 18 towns besides Paris; but only in Paris are the five co-existing faculties organized into a university. The monopoly, hitherto enjoyed by the U. of F., of opening schools of law and medicine, and of conferring degrees, was abolished 1875. The Rom. Catholics have availed themselves of this to institute colleges claiming the dignity of universities, but under ecclesiastical control: thus there is now a 'Catholic Univ. of Paris.' The official lists of 1880 recognized 7 faculties of theology, 12 of law, 15 of the sciences, 15 of letters, and 6 of medicine and pharmacy. —For the Paris faculties of the U. of F., see SORBONNE. The Collége de France (q.v.) is a quite distinct institution, independent of the U. of France.

UNIVERSITY SETTLEMENTS: see COLLEGE AND UNIVERSITY SETTLEMENTS.

UNIVOCAL, a. *ū-nĭv'ō-kăl* [L. *ūnus*, one; *vocālis*, sounding, sonorous—from *vox* or *vōcem*, a voice: F. *univoque;* It. *univoco*, univocal]: having one meaning only; having unison of sound; unmistakable: N. a word having one signification or meaning. UNIV'OCALLY, ad. *-lĭ*, in a manner not to be mistaken.

UNJOINED, a. *ŭn-joynd':* not connected; not united.

UNJOINTED, a. *ŭn-joynt'ĕd:* having no joinings; having no articulation, as the stem of a plant.

UNJUDGED, a. *ŭn-jŭjd':* not tried; not censured rashly.

UNJUST, a. *ŭn-jŭst:* not just; not actuated or acting by principles of right or equity; contrary to the standard of right; not equitable. UNJUST'LY, ad. wrongfully.

UNJUSTIFIABLE, a. *ŭn-jŭs'tĭ-fī'ă-bl:* that cannot be proved to be right, that cannot be defended. UNJUS'TIFI'ABLY, ad. UNJUS'TIFIED, a. not vindicated; not pardoned. UNJUS'TIFI'ABLENESS, n. *-ă-bl-nĕs,* the quality of being unjustifiable.

UNKEMPT, a. *ŭn-kĕmt'* [see COMB 1]: uncombed; unpolished.

UNKENNEL, v. *ŭn-kĕn'nĕl:* to drive from a hole, as a fox; to release from a kennel; to rouse from secrecy. UNKEN'NELLING, imp. UNKEN'NELLED, pp.: ADJ. let loose from confinement; driven from his hole, as a fox.

UNKENT, a. *ŭn-kĕnt:* in *OE.* and *Scot.*, unknown.

UNKEPT, a. *ŭn-kĕpt':* not retained or preserved; not observed.

UNKIAR-SKELESSI, *ûn'kĭ-âr-skā-lĕs'sē:* small town near Scutari, on the Asiatic shore of the Bosporus, giving name to a treaty concluded there between Turkey and Russia 1833. This treaty, which consisted of six articles, was for mutual defensive alliance; but a secret article was subjoined, by which the sultan agreed to close the Strait of the Dardanelles against all foreign vessels of war whenever Russia should be at war. By the treaty at London 1841, which annulled the stipulations of U.-S., it was agreed that no foreign ship of war should enter the strait except with the permission of Turkey.

UNKIND, a. *ŭn-kīnd′:* not benevolent; not obliging; harsh; cruel; in *OE.*, unnatural. UNKIND′LY, ad. in an unkind manner; without kindness or affection; in *OE.*, in a manner contrary to nature: ADJ. harsh; disagreeable; in *OE*, unnatural; contrary to nature; malignant. UNKIND′NESS, n. want of good-will; disobliging treatment; want of natural affection. UNKIND′LINESS, n. quality of being unkindly; malignity; ill-will.

UNKING, v. *ŭn-kĭng′:* to deprive of royalty. UNKINGLIKE, a. *ŭn-kĭng′lĭk*, or UNKING′LY, a. unbecoming a king; not noble.

UNKISS, v. *ŭn-kĭs′:* in *OE.*, to cancel an oath or obligation by kissing again. UNKISSED, a. *ŭn-kĭst′*, not kissed.

UNKNIGHTLY, a. *ŭn-nīt′lĭ:* unbecoming a knight.

UNKNIT, v. *ŭn-nĭt′:* to separate; to loose; to open out work that has been knit.

UNKNOT, v. *ŭn-nŏt′:* to untie; to free from knots UNKNOT′TED, a. *-tĕd*, untied.

UNKNOWING, a. *ŭn-nō′ĭng:* not knowing; ignorant. UNKNOW′INGLY, ad. UNKNOW′ABLE, a. *-nō′ă-bl*, that cannot be known; incapable of being known: N. that which cannot be known. UNKNOWN′, a. not known; not understood clearly; doubtful; not recognized by remembrance; not ascertained; greater than is imagined; in *OE*, not having had intercourse with; not having had communication: N. one who cannot be identified; a stranger. UNKNOWN TO, not within the knowledge of. THE UNKNOWN, that which is not or cannot be known.

UNLABORIOUS, a. *ŭn′lă-bō′rĭ-ŭs:* not laborious; not difficult to be done. UN′LABO′RIOUSLY, ad. UNLA′BORED, a not tilled; that offers without effort; easy; not stiff, as speech.

UNLACE, v. *ŭn-lās′:* to loose from a fastening of cord or strings passed through holes; in *OE.*, to divest of ornaments or dress. UNLAC′ING, imp. UNLACED′, pp.

UNLADE, v. *ŭn-lād′:* to unload; to take out the cargo of. UNLA′DING, imp. UNLA′DEN, pp.

UNLADYLIKE, a. *ŭn-lā′dĭ-lĭk:* not becoming a lady.

UNLAID, a. *ŭn-lād′:* not placed; not fixed; not allayed or pacified.

UNLAMENTED, a. *ŭn′lă-mĕnt′ĕd:* not regretted; not mourned for.

UNLASH, v. *ŭn-lăsh′:* to loose, as what is bound with a rope to something else.

UNLATCH, v. *ŭn-lăch′:* to open or loose by lifting the latch.

UNLAVISHED, a. *ŭn-lăv′ĭsht:* not lavished; not wasted; not thrown away.

UNLAW, v. *ŭn-law′:* in *OE.*, to take from law its authority; in *Scots law*, to impose a fine on: N. in *Scots law*, a fine or penalty imposed on law-breakers; an offense against the law.

UNLAWFUL, a. *ŭn-law'fûl:* contrary to law; illegal; bastard. UNLAW'FULLY, ad. UNLAW'FULNESS, n. state of being illegal or illegitimate.

UNLAY, v. *ŭn-lā':* to untwist, as the strands of a rope.

UNLEARN, v. *ŭn-lėrn':* to forget something that has been learned. UNLEARN'ING, imp. UNLEARNED', pp. *-lėrnd'*, forgotten: ADJ. *ŭn-lėrn'ĕd*, ignorant; not instructed; not gained by study; in *OE.*, not suitable to a learned man. UNLEARN'EDLY, ad.

UNLEAVENED, a. *ŭn-lĕv'nd:* not fermented, as bread.

UNLEAV'ENED BREAD: as especially assigned for use in the Eucharist (q.v.), bread made without leaven or yeast; bread in which no ferment or leaven has been used. —Among the Jews the paschal lamb was eaten with U. B. The use of U. B. in the Eucharist has long been a subject of controversy between the Latin Church on one hand and the Greek and other oriental churches on the other; with the latter of whom the Reformed churches in later times have conformed in their practice at the Lord's Supper. The early history of the usage is obscure; but the Western Church had certainly, from a very remote date, employed *azyms*, or U. B.; nor was this usage made a subject of controversy with the Latins by Photius, on occasion of the dispute between the churches, which arose during his patriarchate. In the later controversy, however, under Michael Cerularius (see GREEK CHURCH), the question of azyms became very prominent, and the diversity of practice is still in controversy between the Greeks and Latins. The principal argument alleged by the advocates of leavened bread is founded on the assumption that the Last Supper of the Lord Jesus took place on the eve of the Passover, i.e., on the 13th day of the month Nisan, on which day common bread, and not the azyms, must have been used; and on this and some other grounds, some writers, even among the Rom. Catholics, especially the learned Jesuit Sirmond, have maintained that the Last Supper was actually celebrated in leavened bread. On the other hand, however, it is contended that the Last Supper, being held in the evening of that day, was, in the strictest sense, Christ's celebration of the Passover, and therefore (Ex. xii. 8–20), that the bread can have been no other than azym, or unleavened. All Rom. Catholic writers, and the more learned among the Greeks, are agreed that the Eucharist may be *validly* consecrated with either leavened or unleavened bread.

UNLESS, conj. *ŭn-lĕs'* [originally written *onless, onlesse*, a combination of *on* with *less*]: except; if not; supposing that not: also used prepositionally by Shakespeare.

UNLESSONED, a. *ŭn-lĕs'nd:* not taught.

UNLETTERED, a. *ŭn-lĕt'tėrd:* not learned; untaught; illiterate; ignorant; not marked with letters.

UNLEVEL, a. *ŭn-lĕv'ĕl:* not even. UNLEV'ELLED, a. not levelled; not laid even.

UNLICENSED, a. *ŭn-lī'sĕnst:* not licensed; without permission by authority; carried on without authority.

UNLICKED, a. *ŭn-lĭkt':* shapeless; not formed to smoothness; rough; uncultured.

UNLIGHTED, a. *ŭn-līt'ĕd:* not lighted, as a lamp; not kindled; not illuminated.

UNLIGHTSOME, a. *ŭn-līt'sŭm:* dark; wanting light.

UNLIKE, a. *ŭn-līk':* having no resemblance; dissimilar. UNLIKE'LY, a. improbable; such as cannot be reasonably expected: AD. improbably. UNLIKE'NESS, n. want of resemblance. UNLIKE'LIHOOD, n., or UNLIKE'LINESS, n. state of being unlikely; improbability.

UNLIMBER, v. *ŭn-lĭm'bĕr:* in *artillery,* to detach the limber from (a field-piece). UNLIM'BERING, imp. UNLIM'BERED, pp.

UNLIMITED, a. *ŭn-lĭm'ĭ-tĕd:* not limited; having no bounds; indefinite; not restrained. UNLIM'ITEDNESS, n. *-nĕs,* the state of being unlimited. UNLIM'ITABLE, a. *-tă-bl,* in *OE.,* incapable of being limited.

UNLINEAL, a. *ŭn-lĭn'ĕ-ăl:* not lineal; not coming in the order of succession.

UNLINING, n. *ŭn-līn'ĭng:* in *bot.,* the separation of parts originally united; same as CHORISIS.

UNLINK, v. *ŭn-lĭngk':* to separate links; to disconnect; to loosen.

UNLIQUEFIED, a. *ŭn-lĭk'wĕ-fīd:* not dissolved.

UNLIQUIDATED, a. *ŭn lĭk'wĭ-dā-tĕd:* not liquidated or settled; not fixed as regards amount; not paid.

UNLOAD, v. *ŭn-lōd':* to discharge of a load or cargo, as a ship; to disburden; to take out the charge of a gun. UNLOAD'ING, imp. UNLOAD'ED, pp.

UNLOCATED, a. *ŭn lō'kā-tĕd:* not located or placed; in the *United States,* unsurveyed and not laid out, as land.

UNLOCK, v. *ŭn-lŏk':* to unfasten; to lay open. UNLOCKED', a. not made fast.

UNLOOKED-FOR, a. *ŭn-lŭkt'fŏr:* not expected; not foreseen. UNLOOKED', a. in *OE.,* unlooked-for.

UNLOOSE, v. *ŭn-lōs':* to loose; to untie; to let go from a fastening; to unravel. UNLOOS'ING, imp. UNLOOSED', pp. set free; untied. UNLOOSEN, v. *ŭn-lōs'n,* to untie.

UNLOVED, a. *ŭn-lŭvd':* not loved. UNLOVE'LY, a. destitute of the qualities that attract love; not amiable; not beautiful. UNLOVE'LINESS, n. want of beauty or the qualities that attract love. UNLOV'ING, a. not fond. UNLOV'INGLY, ad.

UNLUCKY, a. *ŭn-lŭk'ĭ:* unfortunate; not successful; subject to frequent misfortunes; ill-omened. UNLUCK'ILY, ad. unfortunately. UNLUCK'INESS, n. ill-fortune.

UNMADE, a. *ŭn mād':* not yet formed: see UNMAKE.

UNMAIDENLY, a. *ŭn-mād'n-lĭ:* not becoming a maiden.

UNMAIMED, a. *ŭn-māmd':* not maimed; not disabled in any limb; sound.

UNMAKE, v. *ŭn-māk':* to destroy the essential form and qualities of; to deprive of form or being. UNMA'-KING, imp.

UNMALLEABLE, a. *ŭn-măl'lĕ-ă-bl:* not malleable; not capable of being hammered into a plate.

UNMAN, v. *ŭn-măn':* to deprive of the qualities of a man; to dishearten; to deject; to emasculate; to deprive of men. UNMAN'NING, imp.. UNMANNED', pp. a. deprived of the fortitude proper to a man; dispirited; dejected; not furnished with men, as a ship or fort; in *falconry*, not tamed. UNMAN'LIKE, a. not becoming a man. UNMAN'LY, a. unbecoming a man; not worthy of a noble mind; base; cowardly. UNMAN'LINESS, n. the state or quality of being unmanly. UNMAN'FUL, a. not becoming a man.

UNMANAGEABLE, a. *ŭn-măn'āj-ă-bl:* not manageable; not easily restrained or directed; not easily wielded. UNMAN'AGEABLY, ad. UNMAN'AGEABLENESS, n. the state of being unmanageable. UNMAN'AGED, a. not tutored; not broken in.

UNMANNERLY, a. *ŭn-măn'nĕr-lĭ:* ill-bred; rude in behavior: AD. in *OE.*, uncivilly. UNMAN'NERED, a. uncivil; rude. UNMAN'NERLINESS, n. rudeness of behavior.

UNMANUFACTURED, a. *ŭn-măn'ū-făk'tūrd:* not manufactured; not wrought into proper form for use.

UNMANURED, a. *ŭn'mă-nūrd':* not enriched by manure.

UNMARKED, a. *ŭn-mârkt':* having no mark; not regarded; undistinguished.

UNMARKETABLE, a. *ŭn-mâr'kĕt-ă-bl:* not fit for sale.

UNMARRED, a. *ŭn mârd':* not injured or spoiled.

UNMARRIAGEABLE, a. *ŭn-măr'ĭj-ă-bl:* too young to be married; disqualified, as by youthfulness, for marriage. UNMAR'RIED, a. having no husband or wife.

UNMARSHALLED, a. *ŭn-mâr'shald:* not disposed or arrayed in order.

UNMASK, v. *ŭn-mâsk':* to strip off any disguise; to lay open; to expose to view. UNMASK'ING, imp. UNMASKED', pp.: ADJ. open; exposed to view.

UNMATCHED, a. *ŭn-măcht':* having no match or equal. UNMATCH'ABLE, a. *-ă-bl*, not to be matched.

UNMEANING, a. *ŭn-mēn'ĭng:* having no meaning; not expressive; not indicating intelligence. UNMEAN'INGLY, ad. UNMEAN'INGNESS, n. the state of being unmeaning. UNMEANT', a. *-mĕnt*, not intended.

UNMEASURABLE, a. *ŭn-mĕzh'ū-ră-bl:* boundless; immeasurable. UNMEAS'URABLY, ad. *-blĭ*, beyond all bounds; beyond measure. UNMEAS'URED, a. not measured; plentiful beyond measure; immense; infinite.

UNMEDITATED, a. *ŭn-mĕd'ĭ-tā-tĕd:* not meditated; not prepared by previous thought.

UNMEET, a. *ŭn-mēt':* not fit or proper; not worthy or suitable. UNMEET'LY, ad. in an unmeet manner; not properly. UNMEET'NESS, n. unfitness; unsuitableness.

UNMELLOWED, a. *ŭn-měl'lōd:* not fully matured; not toned down, as by age.

UNMELODIOUS, a. *ŭn'měl-ō'dĭ-ŭs:* wanting melody; harsh. UN'MELO'DIOUSLY, ad. UN'MELO'DIOUSNESS, n. the state of being unmelodious.

UNMELTED, a. *ŭn-mělt'ĕd:* not melted; undissolved; not softened.

UNMENTIONABLE, a. *ŭn-mĕn'shŭn-ă-bl:* not to be mentioned or named. UNMEN'TIONABLES, n. plu. a familiar euphemism for trousers. UNMEN'TIONED, a. not named.

UNMERCENARY, a. *ŭn-mĕr'sĕ-năr-ĭ:* not mercenary; not venal; disinterested.

UNMERCHANTABLE, a. *ŭn-mĕr'chănt-ă-bl:* that cannot be sold; unsalable.

UNMERCIFUL, a. *ŭn-mĕr'sĭ-fŭl:* cruel; pitiless; not disposed to spare or forgive; hard-hearted. UNMER'CIFULLY, ad. UNMER'CIFULNESS, n. want of tenderness and compassion toward those in one's power.

UNMERITED, a. *ŭn-mĕr'ĭ-tĕd:* not deserved; unjust. UNMER'ITABLE, a. *-ĭ-tă-bl,* in *OE.,* having no merit.

UNMILITARY, a. *ŭn-mĭl'ĭ-tĕr-ĭ:* not according to military rules or customs; not military in character, appearance, or the like.

UNMILKED, a. *ŭn-mĭlkt':* not milked.

UNMILLED, a. *ŭn-mĭld':* not milled, as coin.

UNMINDED, a. *ŭn-mīnd'ĕd:* not heeded. UNMIND'FUL, a. not attentive; regardless. UNMIND'FULLY, ad. UNMIND'FULNESS, n. the state of being unmindful.

UNMINGLED, a. *ŭn-mĭng'gld:* not mixed; pure.

UNMINISTERIAL, a. *ŭn'mĭn-ĭs-tē'rĭ-ăl:* not ministerial; not pertaining to or befitting a minister. UN'MINISTE'RIALLY, ad.

UNMISSED, a. *ŭn-mĭst':* not missed; not perceived to be gone or lost.

UNMISTAKABLE, a. *ŭn'mĭs-tā'kă-bl:* that cannot be mistaken or misunderstood; also UNMISTAKEABLE. UN'MISTA'KEN, a. not wrong in opinion or judgment; sure.

UNMITIGABLE, a. *ŭn-mĭt'ĭ-gă-bl:* that cannot be alleviated or soothed. UNMIT'IGATED, a. not softened in severity or hardness; not lessened.

UNMIXED, a. *ŭn-mĭkst':* not mingled; pure; unadulterated.

UNMODERNIZED, a. *ŭn-mŏd'ĕrn-īzd:* not modernized; not adapted to modern ideas or style.

UNMODIFIED, a. *ŭn-mŏd'ĭ-fīd:* not altered in form. UNMOD'IFIABLE, a. not to be modified or qualified in meaning. UNMOD'IFI'ABLENESS, n.

UNMOD'IFIED-DRIFT, n.: in *geol.*, a Canadian glacial deposit laid down while glacial action was at its maximum in N. America; called also *Hardpan.*

UNMODISH, a. *ŭn-mō'dĭsh:* not in the mode; not fashionable.

UNMODULATED, a. *ŭn-mŏd'ū-lā-tĕd:* not modulated; not varied in a musical manner, as a sound or musical note

UNMOIST, a. *ŭn-moyst':* not moist or wet. UNMOISTENED, a. *ŭn-moys'nd,* not made moist or humid.

UNMOLD, v. *ŭn-mōld':* to change as to the form. UNMOLD'ED, a. not shaped or formed.

UNMOLESTED, a. *ŭn'mŏ-lĕst'ĕd:* not molested; not disturbed; free from disturbance.

UNMOOR, v. *ŭn-mŏr':* to loose from anchorage or moorings, as a ship; to bring to the state of riding with a single anchor. UNMOOR'ING, imp. UNMOORED', pp.

UNMORTIFIED, a. *ŭn-mŏr'tĭ-fīd:* not mortified; not subdued by sorrow.

UNMOTHERLY, a. *ŭn-mŭth'ĕr-lĭ:* not becoming a mother.

UNMOUNTED, a. *ŭn-mownt'ĕd:* not mounted, in any sense of the verb *mount.*

UNMOVABLE, a. *ŭn-mŏv'ă-bl:* that cannot be moved; firm; immovable. UNMOV'ABLY, ad. UNMOVED', a. not transferred from one place to another; not changed in purpose; firm; not having the passions excited; tranquil. UNMOV'EDLY, ad. UNMOV'ING, a. not moving; having no power to affect the passions.

UNMUFFLE, v. *ŭn-mŭf'l:* to remove a muffler or the mufflings from; to uncover.

UNMURMURING, a. *ŭn-mĕr'mĕr-ĭng:* not complaining. UNMUR'MURED, a. not complained of.

UNMUSICAL, a. *ŭn-mū'zĭ-kăl:* not musical; harsh; not pleasing to the ear. UNMU'SICALLY, ad.

UNMUTILATED, a. *ŭn-mū'tĭ-lā-tĕd:* not mutilated; entire.

UNMUZZLE, v. *ŭn-mŭz'l:* to loose from a muzzle; remove the muzzle from; to free from restraint. UNMUZ'ZLING, imp. UNMUZ'ZLED, pp.

UNNA, *ûn'nâ:* small town of Prussia, in Westphalia, 19 m. n.w. of Arnsberg. It was formerly fortified, was one of the Hanse Towns (q.v.) and had a part in the history of the Femgerichte (q v.). About a m. to the north are the famous salt-works of Königsborn, which yield 120,000 cwts. of salt annually. The principal industries are weaving (linen and hosiery), brewing, and distilling. Pop. (1880) 7,690.

UNNAMED, a. *ŭn-nāmd':* not named or mentioned.

UNNAPPED, a. *ŭn-năpt':* without nap, as cloth.

UNNATURAL, a. *ŭn-năt'ū-răl* or *-năt'chū-răl:* contrary to nature; acting without the affections of our common humanity; not agreeable to the real condition of persons or things; forced; artificial; affected. UNNAT'URALLY, ad. UNNAT'URALIZE, v. *-ăl-īz,* to divest of the affections which have been implanted by nature; to divest of the character and status of a subject or citizen. UNNAT'URALIZED, a. *-īzd,* not naturalized; not admitted to the privileges of a subject or citizen.

UNNAVIGABLE, a. *ŭn-năv'ĭ-gă-bl:* not navigable. UNNAV'IGATED, a. not passed over in ships.

UNNECESSARY, a. *ŭn-nĕs'ĕs-sĕr-ĭ:* needless; useless; not required by the circumstances of the case. UNNEC'ESSARILY, ad. needlessly. UNNEC'ESSARINESS, n. *-nĕs,* uselessness; needlessness.

UNNEIGHBORLY, a. *ŭn-nā'bĕr-lĭ:* not neighborly; not in keeping with the duties or obligations implied in being neighbors; not kind and friendly: AD. in *OE.,* in a manner not becoming a neighbor.

UNNERVE, v. *ŭn-nĕrv':* to deprive of force or strength; to enfeeble. UNNERV'ING, imp. UNNERVED', pp. deprived of nerve or strength: ADJ. weak; feeble.

UNNOTED, a. *ŭn-nō'tĕd:* not noted; not observed or remarked; not distinguished; not recorded.

UNNOTICED, a. *ŭn-nō'tĭst:* not regarded or observed; not treated with the usual marks of respect; not hospitably entertained; slighted.

UNNUMBERED, a. *ŭn-nŭm'bĕrd:* not numbered or enumerated; indefinitely numerous; innumerable.

UNOBJECTIONABLE, a. *ŭn'ŏb-jĕk'shŭn-ă-bl:* not liable to objection; that need not be condemned as faulty or improper.

UNOBNOXIOUS, a. *ŭn'ŏb-nŏk'shŭs:* not liable; not exposed to hurt; not obnoxious.

UNOBSCURED, a. *ŭn'ŏb-skūrd':* not darkened or clouded.

UNOBSERVABLE, a. *ŭn'ŏb-zĕr'vă-bl:* not discoverable. UN'OBSER'VANT, a. not attentive; heedless. UN'OBSERVED', a. not noticed; not regarded; not heeded. UN'OBSER'VEDLY, ad. UN'OBSER'VING, a. inattentive; heedless. UN'OBSER'VANCE, n. *-văns,* state or quality of being unobservant; disregard.

UNOBSTRUCTED, a. *ŭn'ŏb-strŭkt'ĕd:* not obstructed; not filled with impediments; not hindered. UN'OBSTRUC'TIVE, a. not presenting any obstacle.

UNOBTAINABLE, a. *ŭn'ŏb-tān'ă-bl:* that cannot be obtained; not within reach or power. UN'OBTAINED', a. not gained; not acquired.

UNOBTRUSIVE, a. *ŭn'ŏb-trō'sĭv:* not forward; modest. UNOBTRU'SIVELY, ad.

UNOCCUPIED, a. *ŭn-ŏk'kū-pīd:* not occupied; not possessed; not engaged in business; not employed, as time; being at leisure.

UNOFFENDING, a. *ŭn'ŏf-fĕnd'ĭng:* not offending; not giving offense; harmless; not sinning.

UNOFFICIAL, a. *ŭn'ŏf fĭsh'ăl:* not official; not pertaining to an office or public trust; not proceeding from the proper authority; in a private capacity. UN'OFFI'CIOUS, a. not forward or intermeddling.

UNOPENED, a. *ŭn-ō'pnd:* not opened; remaining close, shut, or sealed.

UNOPERATIVE, a. *ŭn-ŏp'ĕr-ā-tĭv:* producing no effect; inoperative.

UNOPPOSED, a. *ŭn'ŏp-pōzd':* not opposed; not resisted; not meeting with any hindrance.

UNOPPRESSED, a. *ŭn'ŏp-prĕst':* not unduly burdened. UN'OPPRESS'IVE, a. not oppressive or burdensome.

UNORGANIZED, a. *ŭn-ŏr'găn-īzd:* not organized; not having the parts arranged and constituted; destitute of organic structure.

UNORIGINATED, a. *ŭn'ō-rĭj'ĭ-nā-tĕd:* having no birth or creation. UN'ORIG'INAL, a. *-ĭ-năl,* not original; having no birth; ungenerated.

UNORNAMENTAL, a. *ŭn-ŏr'nă-mĕnt'ăl:* not ornamental—hence, plain; undecorated. UNOR'NAMENTED, a. not adorned.

UNORTHODOX, a. *ŭn-ŏr'thŏ-dŏks:* not orthodox; heterodox. UNOR'THODOXY, n. want of orthodoxy.

UNOSTENTATIOUS, a. *ŭn-ŏs'tĕn-tā'shŭs:* not ostentatious; not making a display; not showy; modest; unassuming. UN'OSTENTA'TIOUSLY, ad. UN'OSTENTA'TIOUSNESS, n. *-nĕs,* freedom from ostentation.

UNOWED, a. *ŭn-ōd':* not owed; in *OE.,* having no owner.

UNOWNED, a. *ŭn-ōnd':* not owned or acknowledged, as an act, etc.; having no known owner; not divulged.

UNOXYGENATED, a. *ŭn-ŏks'ĭ-jĕn-ā-tĕd,* or UNOX'YGENIZED, a. uncombined with oxygen.

UNPACIFIED, a. *ŭn-păs'ĭ-fīd:* not pacified; not appeased; not calmed.

UNPACK, v. *ŭn-păk':* to unloose or open and remove the contents of, as a bale of cloth, a box, or the like; to disburden. UNPACK'ING, imp. UNPACKED', pp.: ADJ. not filled closely; not selected unjustly, as an *unpacked* jury.

UNPAID, a. *ŭn-pād':* not paid, applied to one who performs the duties of an office gratuitously; not discharged, as a debt; not having received wages, as workmen. UNPAID FOR, a. taken on credit.

UNPAINED, a. *ŭn-pānd':* suffering no pain.

UNPAINTED, a. *ŭn-pānt'ĕd:* not painted.

UNPAIRED, a. *ŭn-pārd':* not paired or coupled.

UNPALATABLE, a. *ŭn-păl'ă-tă-bl:* not agreeable to the taste; not such as to be relished; disagreeable.

UNPARAGONED, a. *ŭn-păr'ă-gŏnd:* unequalled; unmatched.

UNPARALLELED, a. *ŭn-păr'ăl-lĕld:* having no parallel or equal; unequalled.

UNPARDONABLE, a. *ŭn-pâr'dn-ă-bl:* not to be forgiven; that cannot be remitted, as a sin. UNPAR'DONED, a. not granted forgiveness. UNPAR'DONING, a. not disposed to pardon or forgive.

UNPARLIAMENTARY, a. *ŭn-pâr'lĭ-mĕnt'ă-rĭ:* contrary to the usages or rules of parliament, or of a deliberative or legislative body. UNPAR'LIAMENT'ARINESS, n. *-nĕs*, the state of being unparliamentary.

UNPARTED, a. *ŭn-pârt'ĕd:* not separated; not divided.

UNPATENTED, a. *ŭn-păt'ĕnt-ĕd:* not granted or secured by a patent.

UNPATHED, a. *ŭn-pâthd':* untracked; untrodden; with no trace of a path.

UNPATHETIC, a. *ŭn'pă-thĕt'ĭk:* not pathetic; not adapted to excite emotion.

UNPATRIOTIC, a. *ŭn-pā'trĭ-ŏt'ĭk:* not patriotic.

UNPATRONIZED, a. *ŭn-pā'trō-nīzd':* not receiving countenance or friendly support.

UNPAVED, a. *ŭn-pāvd':* not paved; in *OE.*, emasculated.

UNPAY, v. *ŭn pā':* to undo.

UNPEACEABLE, a. *ŭn-pēs'ă-bl:* in *OE.*, quarrelsome; not peaceable.

UNPEG, v. *ŭn-pĕg':* to open a thing closed with a peg or pegs; to unloose.

UNPENETRATED, a. *ŭn-pĕn'ĕ-trā-tĕd:* not entered or pierced.

UNPENSIONED, a. *ŭn-pĕn'shŭnd:* not pensioned; not rewarded by a pension.

UNPEOPLE, v. *ŭn-pē'pl:* to deprive of inhabitants; to depopulate. UNPEO'PLED, a. depopulated; desolate.

UNPERCEIVABLE, a. *ŭn'pĕr-sēv'ă-bl:* that cannot be perceived, discerned, or observed. UNPERCEIV'ABLY, ad. UNPERCEIVED', a. not observed; not noticed.

UNPERFORATED, a. *ŭn-pĕr'fō-rā-tĕd:* not perforated; not penetrated by openings.

UNPERFORMED, a. *ŭn'pĕr-fawrmd':* not performed; not done or executed; not fulfilled. UN'PERFORM'ING, a. not discharging its office.

UNPERJURED, a. *ŭn-pĕr'jûrd:* free from perjury.

UNPERPLEXED, a. *ŭn'pĕr-plĕkst':* not perplexed; not harassed; not complicated.

UNPERUSED, a. *ŭn'pē-rôzd':* not read.

UNPERVERTED, a. *ŭn'pĕr-vĕrt'ĕd:* not perverted; not wrested or turned to a wrong use or meaning.

UNPETRIFIED, a. *ŭn-pĕt'rĭ-fīd:* not petrified; not converted into stone.

UNPHILOSOPHIC, or UN'PHILOSOPH'ICAL, a. *ŭn'fĭl-ō-sŏf'ĭk* or *-ĭ-kăl:* not according to the rules or principles of sound philosophy. UNPHIL'OSOPH'ICALLY, ad. UN'PHILOS'OPHIZE, v. to reduce from the status of a philosopher or reasoning being.

UNPHYSICKED, a. *ŭn-fĭz'ĭkt:* not physicked; without the aid of medicine.

UNPIERCED, a. *ŭn-pērst':* not pierced or penetrated.

UNPILLARED, a. *ŭn-pĭl'lĕrd:* deprived of pillars; without pillars.

UNPILLOWED, a. *ŭn-pĭl'lōd:* having no pillow; unsupported by a pillow.

UNPIN, v. *ŭn-pĭn':* to loose from pins; to unfasten.

UNPINKED, a *ŭn-pĭngkt':* in *OE.*, not marked with eyelet-holes; not pierced, as with a bodkin, sword, or the like.

UNPITIED, a. *ŭn-pĭt'ĭd:* not pitied; not compassionated; not regarded with sympathetic sorrow. UNPIT'IFUL, a. not pitiful; having no pity; not merciful. UNPIT'IFULLY, ad. UNPIT'YING, a. showing no compassion. UNPIT'EOUSLY, ad. without pity; mercilessly.

UNPLACED, a *ŭn-plāst':* not yet placed or located; not having a place, position, or office; disordered; uninvested.

UNPLAGUED, a. *ŭn-plāgd':* not tormented or harassed; not teased.

UNPLANTED, *ŭn-plănt'ĕd:* not planted; of spontaneous growth; not cultivated.

UNPLAUSIBLE, a. *ŭn-plawz'ĭ-bl:* not plausible; not having a fair appearance. UNPLAUS'IVE, a. *-ĭv*, in *OE.*, not applauding; disapproving.

UNPLEASANT, a. *ŭn-plĕz'ănt:* not pleasant; that does not afford pleasure; disagreeable. UNPLEAS'ANTLY, ad. UNPLEAS'ANTNESS, n. the state or quality of being unpleasant; an unpleasant circumstance or event; slight misunderstanding or quarrel. UNPLEAS'ING, a. offensive. UNPLEASED, a. *ŭn-plēzd'*, not pleased; not delighted. UNPLEAS'ING, a. not pleasing; offensive.

UNPLEDGED, a. *ŭn-plĕjd':* not pledged; not engaged by promise; not mortgaged.

UNPLIABLE, a. *ŭn-plī'ă-bl*, or UNPLI'ANT, a.: not pliant; not easily bent; stiff; stubborn; not readily yielding.

UNPLIGHTED, a. *ŭn-plīt'ĕd:* not plighted or pledged.

UNPLOWED, or UNPLOUGHED, a. *ŭn-plowd':* not plowed.

UNPOETIC, a. *ŭn'pō-ĕt'ĭk*, or UN'POET'ICAL, a.: not poetical; destitute of the beauties of poetry; prosaic; unbecoming a poet. UN'POET'ICALLY, ad.

UNPOINTED, a. *ŭn-poynt'ĕd:* having no marks of punctuation; without point or purpose; dull; having no vowel-marks, as in Hebrew; having the points or tagged laces (of a garment) unfastened.

UNPOLARIZED, a. *ŭn-pō'lĕr-īzd:* lacking the property of pointing to the poles of the earth.

UNPOLICIED, a. *ŭn-pŏl'ĭ-sĭd:* without a policy or rational design; irrational.

UNPOLISHED, a. *ŭn-pŏl'ĭsht:* not polished; not refined in manners; rude; rough.

UNPOLITE, a. *ŭn'pō-līt':* not refined in manners; not civil or courteous; rude. UN'POLITE'LY, ad. in an uncivil or rude manner. UN'POLITE'NESS, n. want of refinement in manners; rudeness.

UNPOLLED, a. *ŭn-pōld':* not registered, as a vote at an election; not having voted; in *OE.*, unplundered.

UNPOLLUTED, a. *ŭn'pŏl-lō'tĕd:* not defiled or corrupted.

UNPOPULAR, a. *ŭn-pŏp'ū-lĕr:* not having the public favor; not pleasing or in favor with the people. UNPOPULARLY, ad. UNPOP'ULAR'ITY, n. *-lăr'ĭ-tĭ,* state of not pleasing the people.

UNPORTABLE, a. *ŭn-pōrt'ă-bl:* that cannot be carried.

UNPORTIONED, a. *ŭn-pōr'shŭnd:* without a marriage portion.

UNPOSSESSED, a. *ŭn'pŏz-zĕst':* not held; not occupied. UN'POSSESS'ING, a. in *OE.*, having no possession.

UNPOTABLE, a. *ŭn-pō'tă-bl:* not drinkable.

UNPRACTICED, a. *ŭn-prăk'tĭst:* not skilled; without experience; raw.

UNPRECEDENTED, a. *ŭn-prĕs'ĕ-dĕnt'ĕd:* having no precedent: not justified by the authority of a former example. UNPREC'EDENT'EDLY, ad.

UNPRECISE, a. *ŭn'prĕ-sīs':* not precise; not exact.

UNPREDICT, v. *ŭn'prĕ-dĭkt':* in *OE.*, to recall or nullify a prediction.

UNPREGNANT, a. *ŭn-prĕg'nănt:* not pregnant; not prolific, as in new or striking thoughts; not quick of wit.

UNPREJUDICED, a. *ŭn-prĕj'ū-dĭst:* not prejudiced; free from bias or prepossession; impartial; not preoccupied by opinion.

UNPRELATICAL, a. *ŭn'prĕ-lăt'ĭ-kăl:* unbecoming a prelate.

UNPREMEDITATED, a. *ŭn'prĕ-mĕd'ĭ-tā-tĕd:* not previously prepared in the mind; not done by design; not previously intended.

UNPREPARED, a. *ŭn'prĕ-pärd':* not prepared; not ready; not fitted or furnished by previous measures. UN'PREPAR'EDNESS, n. state of being unprepared.

UNPREPOSSESSED, a. *ŭn-prē'pŏz-zĕst':* not biased by previous opinions; not partial. UNPRE'POSSESS'ING, a. not having a winning or attractive appearance.

UNPRESENTABLE, a. *ŭn'prĕ-zĕnt'ă-bl:* not present able; not fit to be presented or introduced to another, or into society.

UNPRESSED, a. *ŭn-prĕst':* not pressed; not forced.

UNPRESUMING, a. *ŭn'prĕ-zūm'ĭng:* not too confident or bold; modest; retiring.

UNPRESUMPTUOUS, a. *ŭn'prĕ-zŭm'tū-ŭs:* not presumptuous or rash; modest; submissive.

UNPRETENDING, a. *ŭn'prĕ tĕnd'ĭng:* not claiming distinction; modest.

UNPREVAILING, a. *ŭn'prĕ-vāl'ĭng:* of no force; useless.

UNPREVENTABLE, a. *ŭn'prĕ-vĕnt'ā-bl:* not preventable. UN'PREVENT'ED, a. not hindered; in *OE.*, not preceded by anything.

UNPRIESTLY, a. *ŭn-prēst'lĭ:* unsuitable to, or unbecoming, a priest.

UNPRINCELY, a. *ŭn-prĭns'lĭ:* unbecoming a prince.

UNPRINCIPLED, a. *ŭn-prĭn'sĭ-pld:* having no settled principles; destitute of virtue; vicious; wicked.

UNPRINTED, a. *ŭn-prĭnt'ĕd:* not printed, as a literary work; not stamped, as cotton goods.

UNPRIVILEGED, a. *ŭn-prĭv'ĭ-lĕjd:* not privileged.

UNPRIZED, a. *ŭn-prīzd':* not valued; in *OE.*, priceless. UNPRIZ'ABLE, a. *-ā-bl*, in *OE.*, incapable of being prized; not of much value; also, invaluable.

UNPROCLAIMED, a. *ŭn'prō-klāmd':* not proclaimed.

UNPROCURABLE, a. *ŭn'prō-kūr'ā-bl:* not obtainable.

UNPRODUCTIVE, a. *ŭn'prō-dŭk'tĭv:* barren; not producing profit or interest, as money, labor, etc.; ineffective. UN'PRODUC'TIVELY, ad. UN'PRODUC'TIVENESS, n. state of being unproductive.

UNPROFANED, a. *ŭn'prō-fānd':* not profaned; not violated.

UNPROFESSIONAL, a. *ŭn'prō-fĕsh'ŭn-ăl:* not belonging to a profession; not in keeping with the rules or usage of a profession. UN'PROFES'SIONALLY, ad.

UNPROFITABLE, a. *ŭn-prŏf'ĭt ā-bl:* producing no improvement or advantage; useless; resulting in no profit, advantage or gain; serving no purpose. UNPROF'ITABLY, ad. UNPROF'ITABLENESS, n. state of producing no gain or advantage; uselessness. UNPROF'ITED, a. *-ĭ tĕd*, having no gain.

UNPROGRESSIVE, a. *ŭn'prō-grĕs'sĭv:* not progressive.

UNPROHIBITED, a. *ŭn'prō-hĭb'ĭ-tĕd:* not forbidden; hence, lawful.

UNPROJECTED, a. *ŭn'prō-jĕkt'ĕd:* not planned; not formed in the mind.

UNPROLIFIC, a. *ŭn'prō-lĭf'ĭk:* barren; not producing fruit.

UNPROMISING, a. *ŭn-prŏm'ĭs-ĭng:* not affording a favorable prospect of success.

UNPROMPTED, a. *ŭn-prŏmt'ĕd:* not prompted; not dictated or instigated.

UNPRONOUNCEABLE, a. *ŭn'prō-nowns'ă-bl:* that cannot be pronounced; unspeakable. UN'PRONOUNCED', a. not uttered by the mouth.

UNPROPER, a. *ŭn-prŏp'ĕr:* improper. UNPROP'ERLY, ad. *-lĭ*, improperly.

UNPROPHETIC, a. *ŭn'prō-fĕt'ĭk:* not prophetic; lacking the faculty of foreseeing future events; also UN'PROPHET'ICAL, a. *-ĭ-kăl.*

UNPROPITIATED, a. *ŭn'prō-pĭsh'ĭ-ā-tĕd:* not propitiated; not conciliated; not reconciled. UN'PROPI'TIOUS, a. not propitious; not favorable; not disposed to promote. UN'PROPI'TIOUSLY, ad. UN'PROPI'TIOUSNESS, n. the state of being unpropitious.

UNPROPORTIONED, *ŭn'prō-pōr'shŭnd:* not proportioned; disproportionate.

UNPROPPED, a. *ŭn-prŏpt:* not propped or supported; not upheld.

UNPROSPEROUS, a. *ŭn-prŏs'pĕr-ŭs:* not prosperous; not attended with success; unfortunate. UNPROS'PEROUSLY, ad.

UNPROTECTED, a. *ŭn'prō-tĕkt'ĕd:* not protected; not supported or defended; not shielded or covered from danger. UN'PROTECT'ING, a. not shielding from danger.

UNPROTRACTED, a. *ŭn'prō-trăkt'ĕd:* not protracted.

UNPROVED, a. *ŭn-prôvd':* not proved; not established as true; not tried. UNPROVABLE, a. not capable of proof or demonstration.

UNPROVIDED, a. *ŭn'prō-vīd'ĕd:* not provided; unfurnished; unsupplied. UN'PROVIDE', v. *-vīd'*, in *OE.*, to divest or deprive of resolution; to unfurnish.

UNPROVOKED, a. *ŭn'prō-vōkt':* not provoked; not proceeding from a just cause; not incited. UN'PROVOK'ING, a. giving no offense.

UNPRUNED, a. *ŭn-prônd':* not pruned; not cut; not lopped.

UNPUBLISHED, a. *ŭn-pŭb'lĭsht:* not published, as a book; not made public; not given to the public; private.

UNPUNCTUAL, a. *ŭn-pŭngk'tū-ăl:* not punctual.

UNPUNISHED, a. *ŭn-pŭn'ĭsht:* suffered to pass without punishment, or with impunity.

UNPURCHASABLE, a. *ŭn-pĕr'chās-ă-bl:* that cannot be purchased. UNPUR'CHASED, a. not bought.

UNPURGED, a. *ŭn-pĕrjd:* not purified; not purged.

UNPURIFIED, a. *ŭn-pū'rĭ-fīd:* not purified; not freed from foul matter; unsanctified.

UNPURPOSED, a. *ŭn-pĕr'pŭst:* not designed; not intentional.

UNPURSUED, a. *ŭn'pĕr-sūd':* not followed; not prosecuted.

UNQUALIFIED, a. *ŭn-kwŏl'ĭ-fīd:* not qualified; destitute of the requisite talents or accomplishments; not having taken the requisite oaths or provided the required bond or security; not modified by conditions or exceptions. UNQUALIFY, v. to disqualify.

UNQUALITIED, a. *ŭn-kwŏl'ĭ-tĭd:* in *OE.*, deprived of the usual qualities or faculties.

UNQUEEN, v. *ŭn-kwēn':* to divest of the dignity of queen.

UNQUELLED, a. *ŭn-kwĕld':* not subdued.

UNQUENCHABLE, a. *ŭn-kwĕnsh'ă-bl:* that will never be, or cannot be, extinguished. UNQUENCH'ABLENESS, n. UNQUENCH'ABLY, ad. UNQUENCHED', a. *-kwĕnsht'*, not extinguished.

UNQUESTIONABLE, a. *ŭn-kwĕst'yŭn-ă-bl:* not to be doubted; certain; in *OE.*, impatient under questioning; averse to being questioned or spoken to. UNQUEST'IONABLY, ad. without doubt. UNQUEST'IONED, a. not doubted; not examined; indisputable. UNQUEST'IONING, a. not doubting; trusting without reserve.

UNQUIET, a. *ŭn-kwī'ĕt:* not calm or tranquil; restless; troublesome. UNQUI'ETLY, ad. UNQUI'ETNESS, n. restlessness; want of peace; perturbation; uneasiness.

UNQUOTED, a. *ŭn-kwōt'ĕd:* not quoted; applied to commodities not in the prices current or sale-lists; not dealt in or recognized by the stock exchange, as certain kinds of shares or stocks.

UNRACKED, a. *ŭn-răkt':* not freed from the lees.

UNRAKED, a. *ŭn-rākt':* not raked; not raked up or together.

UNRANSACKED, a. *ŭn-răn'săkt:* not ransacked; not searched; in *OE.*, not pillaged.

UNRANSOMED, a. *ŭn-răn'sŭmd:* not ransomed; not liberated from captivity by a price paid.

UNRAVAGED, a. *ŭn-răv'ājd:* not wasted or destroyed.

UNRAVEL, v. *ŭn-răv'l:* to disentangle; to clear from complication or difficulty; to separate connected parts; to unfold; to fray. UNRAV'ELLING, imp. unfolding; clearing from difficulty. UNRAV'ELLED, pp. disentangled.

UNREACHED, a. *ŭn-rēcht':* not reached or attained to.

UNREAD, a. *ŭn-rĕd':* not read; not recited; not perused; not learned in books; illiterate; applied to a proof not examined by the reader or corrector of a printing-office. UNREAD'ABLE, a. *-rēd'ă-bl*, that cannot be read; not legible; not fit for, or worthy of, perusal.

UNREADY, a. *ŭn-rĕd'ĭ:* not ready; not prompt; not prepared; in *OE.*, unfit; ungainly; undressed. UNREAD'ILY, ad. not promptly; not cheerfully. UNREAD'INESS, n. want of readiness; want of preparation.

UNREAL, a. *ŭn-rē'ăl:* not real; not substantial; having appearance only. UN'REAL'ITY, n. want of real existence; that which is unreal or unsubstantial. UNRE'ALIZED, a. not accomplished; not carried out.

UNREAPED, a. *ŭn-rēpt':* not reaped.

UNREASONABLE, a. *ŭn-rē'zn-ă-bl:* exceeding the bounds of reason; immoderate; exorbitant; irrational. UNREA'SONABLY, ad. *-blĭ,* in a manner contrary to reason. UNREA'SONABLENESS, n. state of being unreasonable; excess of demand, passion, and the like. UNREA'SONED, a. not derived from reason. UNREA'SONING, a. not exercising the faculty of reason; wanting reason. UNREA'SON, n. want of reason.

UNREAVE, or UNREEVE, v. *ŭn-rēv':* to remove from a block or tackle, as to *unreave* a rope; to unwind; to disentangle.

UNREBUKED, a. *ŭn'rĕ-būkt':* not eproved or checked. UN'REBUK'ABLE, a. *-ă-bl,* incapable of being rebuked; blameless.

UNRECANTED, a. *ŭn'rĕ-kănt'ĕd:* not retracted.

UNRECEIVED, a. *ŭn'rĕ-sēvd':* not taken; not come into possession; not embraced, as opinions.

UNRECKONED, a. *ŭn-rĕk'nd:* not reckoned or enumerated.

UNRECLAIMED, a. *ŭn'rĕ-klāmd':* not reclaimed; not tamed; not reformed; not recovered, as land from a wild state. UN'RECLAIM'ABLE, a. not capable of being reclaimed; irreclaimable.

UNRECOGNIZABLE, a. *ŭn-rĕk'ŏg-nī'ză-bl:* that cannot be recognized; that cannot be acknowledged; that cannot be received as known. UNREC'OGNIZED, a. not acknowledged or known.

UNRECOMMENDED, a. *ŭn-rĕk'ŏm-mĕnd'ĕd:* not recommended.

UNRECOMPENSED, a. *ŭn-rĕk'ŏm-pĕnst:* not rewarded or compensated.

UNRECONCILABLE, a. *ŭn-rĕk'ŏn-sīl'ă-bl:* not to be reconciled or harmonized; not capable of being appeased; implacable. UNREC'ONCILED, a. *-sīld,* not reconciled or harmonized; not appeased; not having become favorable; not having made peace with.

UNRECORDED, a. *ŭn'rĕ-kawrd'ĕd:* not recorded; not registered; not kept in remembrance by some writing or monument.

UNRECOUNTED, a. *ŭn'rĕ-kownt'ĕd:* not related or told.

UNRECOVERABLE, a. *ŭn'rĕ-kŭv'ĕr-ă-bl:* that cannot be recovered or regained. UN'RECOV'ERED, a. not regained.

UNRECTIFIED, a. *ŭn-rĕk'tĭ-fīd:* not corrected. as an error; not refined, as spirits.

UNRECURING, a. *ŭn'rĕ-kūr'ĭng:* that cannot be cured; incurable.

UNREDEEMABLE, a. *ŭn'rĕ-dēm'ă-bl.* that cannot be redeemed; that cannot be purchased back. UN'REDEEMED', a. not redeemed; not ransomed; not paid; not neutralized or counterbalanced.

UNREDRESSED, a. *ŭn'rĕ-drĕst':* not redressed.

UNREDUCED, a. *ŭn'rĕ-dūst':* not reduced, not lessened in size or amount. UN'REDU'CIBLE, a. that cannot be reduced or lessened in amount.

UNREEVE. see UNREAVE.

UNREFINED, a. *ŭn'rĕ-fīnd':* not refined, clarified, or freed from impurities; not polished in manners.

UNREFLECTING, a. *ŭn'rĕ-flĕkt'ĭng:* not reflecting; wanting in thought; inconsiderate.

UNREFORMED, a. *ŭn'rĕ-fawrmd':* not reformed; not reclaimed from vice; not amended; not corrected.

UNREFRACTED, a. *ŭn'rĕ-frăkt'ĕd:* not turned from a direct course, as rays of light.

UNREFRESHED, a. *ŭn'rĕ-frĕsht':* not refreshed; not relieved from fatigue; not cheered. UN'REFRESH'ING, a. not relieving from fatigue or weariness; not invigorating.

UNREFUTED, a. *ŭn'rĕ-fū'tĕd:* not refuted or proved to be false or wrong.

UNREGARDED, a. *ŭn'rĕ-gârd'ĕd:* not noticed; not heeded; neglected.

UNREGENERACY, a. *ŭn'rĕ-jĕn'ĕr-ă-sĭ:* state of being unrenewed in heart. UN'REGEN'ERATE, a., or UN'REGEN'ERATED, a. not renewed in heart; remaining at enmity with God.

UNREGISTERED, a. *ŭn-rĕj'ĭs-tĕrd:* not registered; not recorded.

UNREGRETTED, a. *ŭn'rĕ-grĕt'tĕd:* not lamented.

UNREGULATED, a. *ŭn-rĕg'ū-lā-tĕd:* not regulated; not reduced to order.

UNREHEARSED, a. *ŭn'rĕ-hĕrst':* not recited or repeated.

UNREINED, a. *ŭn-rānd':* not restrained by the bridle; not held in check.

UNRELATED, a. *ŭn'rĕ-lā'tĕd:* not related; not connected by blood or affinity.

UNRELAXING, a. *ŭn'rĕ-lăks'ĭng:* not abating in attention or severity.

UNRELENTING, a. *ŭn'rĕ-lĕnt'ĭng:* pitiless; inexorable; hard; cruel; inflexibly rigid. UN'RELENT'INGLY, ad.

UNRELIEVED, a. *ŭn'rĕ-lēvd':* not relieved, as soldiers on guard; not eased or delivered from pain; not delivered from distress. UN'RELIEV'ABLE, a. incapable of being relieved; admitting no succor.

UNREMARKED, a. *ŭn'rĕ-mârkt':* unobserved. UNREMARK'ABLE, not worthy of remark or notice.

UNREMEDIED, a. *ŭn-rĕm'ĕ-dĭd:* not remedied; not cured; not repaired. UNREME'DIABLE, a. *-rĕ-mē'dĭ-ă-bl,* irremediable; incapable of being remedied.

UNREMEMBERED, a. *ŭn'rĕ-mĕm'bêrd:* not retained in the mind.

UNREMITTED, a. *ŭn'rĕ-mĭt'tĕd:* not remitted; not forgiven; not relaxed; not abated. UN'REMIT'TING, a. not remitting; not abating; incessant; continued. UN'REMIT'TINGLY, ad.

UNREMOVABLE, a. *ŭn'rĕ-môv'ă-bl:* that cannot be displaced; fixed. UN'REMOV'ABLY, ad. *-blĭ,* in an unremovable manner. UN'REMOVED', a. not taken away; not capable of being removed.

UNRENEWED, a. *ŭn'rĕ-nūd':* not made anew; not renovated; unregenerate.

UNREPAID, a. *ŭn'rĕ-pād':* not repaid; not compensated.

UNREPAIRED, a. *ŭn'rĕ-pärd':* not repaired or mended.

UNREPEALED, a. *ŭn'rĕ-pēld':* not repealed or abrogated; remaining in force; not revoked.

UNREPEATED, a. *ŭn'rĕ-pēt'ĕd:* not done or spoken again.

UNREPENTANT, a. *ŭn'rĕ-pĕnt'ănt,* or UN'REPENT'ING, a.: not feeling sorrow or regret; not contrite. UN'REPENT'ED, a. not sorrowed for or regretted. UN'REPENT'ANCE, n. *-pĕnt'ăns,* in *OE.*, impenitence.

UNREPINING, a. *ŭn'rĕ-pīn'ĭng:* not peevishly murmuring or complaining. UN'REPIN'INGLY, ad.

UNREPLENISHED, a. *ŭn'rĕ-plĕn'ĭsht:* not refilled or adequately supplied.

UNREPORTED, a. *ŭn'rĕ-pōrt'ĕd:* not reported, as a speech; not yet officially made known; not yet published.

UNREPRESENTED, a. *ŭn-rĕp'rĕ-zĕnt'ĕd:* not represented; having no one to act in one's stead.

UNREPRESSED, a. *ŭn'rĕ-prĕst':* not crushed; not subdued. UN'REPRES'SIBLE, a. that cannot be put down or restrained; irrepressible.

UNREPRIEVABLE, a. *ŭn'rĕ-prēv'ă-bl:* that cannot be respited from death. UN'REPRIEVED', a. not respited.

UNREPROVABLE, a. *ŭn'rĕ-prôv'ă-bl:* that cannot be justly blamed or censured; blameless. UN'REPROVED', a. not liable to reproof or blame; not censured.

UNREQUITED, a. *ŭn'rĕ-kwī'tĕd:* not requited; not recompensed.

UNRESENTED, a. *ŭn'rĕ-zĕnt'ĕd:* not resented; not regarded with anger.

UNRESERVED, a. *ŭn'rĕ-zĕrvd':* not reserved; not limited; not withheld in part; open; frank; free; full; concealing or withholding nothing. UN'RESERV'EDLY, ad. without limitation; frankly; without concealment. UN'RESERVE', n., or UN'RESERV'EDNESS, n. *-ĕd-nĕs,* frankness; openness.

UNRESIGNED, a. *ŭn'rĕ-zīnd':* not surrendered; not submissive.

UNRESISTED, a. *ŭn'rĕ-zĭst'ĕd:* not opposed; in *OE.*, that cannot be resisted; resistless. UN'RESIST'ING, a. not making resistance; submissive; humble. UN'RESIST'INGLY, ad.

UNRESOLVED, a. *ŭn'rĕ-zŏlvd':* not resolved; not determined; not cleared; not solved.

UNRESPECTED, a. *ŭn'rĕ-spĕkt'ĕd:* not honored or esteemed. UNRESPECT'ABLE, a. not respectable.

UNRESPITED, a. *ŭn-rĕs'pĭt-ĕd:* not respited; in *OE.*, admitting no pause or intermission.

UNREST, n. *ŭn-rĕst':* disquiet; want of tranquillity. UNREST'ING, a. not tranquil; always moving or tossing about.

UNRESTORED, a. *ŭn'rĕ-stōrd':* not given back; not restored, as a building; not replaced in a former position; not having recovered health.

UNRESTRAINED, a. *ŭn'rĕ-strānd':* not restrained; not checked or repressed. UN'RESTRAINT', n. freedom from control.

UNRESTRICTED, a. *ŭn'rĕ-strĭkt'ĕd:* not limited.

UNRETURNED, a. *ŭn'rĕ-tĕrnd':* not brought or sent back; not restored; not come back.

UNREVEALED, a. *ŭn'rĕ vēld':* not revealed; not discovered; not disclosed.

UNREVENGED, a. *ŭn'rĕ-vĕnjd':* not revenged; not vindicated by just punishment. UN'REVENGE'FUL, a. not disposed to revenge.

UNREVERED, a. *ŭn'rĕ-vērd':* not regarded with veneration. UNREV'ERENCED, a. not reverenced.

UNREVEREND, a. *ŭn-rĕv'ĕr-ĕnd*, or UNREV'ERENT, a. *-ĕnt:* irreverent.

UNREVERSED, a. *ŭn'rĕ-vĕrst':* not reversed; not repealed; not annulled by a counter-decision.

UNREVIEWED, a. *ŭn'rĕ-vūd':* not considered; not reviewed.

UNREVISED, a. *ŭn'rĕ-vīzd':* not revised; not altered and amended.

UNREVIVED, a. *ŭn rĕ-vīvd':* not revived; not recalled into life or force.

UNREVOKED, a. *ŭn'rĕ-vōkt':* not recalled or annulled.

UNREWARDED, a. *ŭn'rĕ-wawrd'ĕd:* not rewarded.

UNRIDDLE, v. *ŭn-rĭd'dl:* to solve or explain.

UNRIFLED, a. *ŭn-rī'fld:* not robbed or plundered; not grooved, as a gun.

UNRIG, v. *ŭn-rĭg':* to strip of rigging, as a ship. UNRIG'GING, imp. UNRIGGED', pp.

UNRIGHTEOUS, a. *ŭn-rīt'yŭs* or *-rī'chŭs:* not just; evil; wicked; contrary to the divine law; not right; dishonest. UNRIGHT'EOUSLY, ad. wickedly. UNRIGHT'EOUSNESS, n. a violation of the divine law; wickedness. UNRIGHTFUL, a. *ŭn-rīt'fŭl*, not rightful; not just. UNRIGHT', a. not right; unjust; wicked.

UNRIP, v. *ŭn-rĭp′:* to open seams; to separate or tear asunder, as clothes or sails; to rip.

UNRIPE, a. *ŭn-rīp′:* not mature; not complete; not brought to a state of perfection; too early. UNRI′PENED, a. not matured. UNRIPE′NESS, n. immaturity.

UNRIVALLED, a. *ŭn-rī′văld:* having no rival; having no equal; matchless.

UNRIVET, v. *ŭn-rĭv′ĕt:* to loose from rivets; to unfasten.

UNROBE, v. *ŭn-rōb′:* to strip of a robe; to undress. UNRO′BING, imp. UNROBED′, pp.

UNROLL, v. *ŭn-rōl′:* to undo or open out that which has been rolled; to display. UNROLL′ING, imp. UNROLLED′, pp.

UNROMANTIC, a. *ŭn′rō-măn′tĭk:* not romantic; not wild and fanciful; of a grave, sober, or matter-of-fact temperament. UN′ROMAN′TICALLY, ad.

UNROOF, v. *ŭn-rôf′:* to strip off the roof or covering of. UNROOF′ING, imp. UNROOFED′, pp.

UNROOSTED, a. *ŭn-rôst′ĕd:* driven from the roost.

UNROOT, v. *ŭn-rôt′:* to tear up by the roots; to extirpate. UNROOT′ED, pp. torn up by the roots.

UNROUGH, a. *ŭn-rŭf′:* smooth; hence, without a beard.

UNROUNDED, a. *ŭn-rownd′ĕd:* not shaped or cut to a round.

UNROUTED, a. *ŭn-rowt′ĕd:* not thrown into disorder; not defeated.

UNRUFFLED, a. *ŭn-rŭf′fld:* calm; tranquil; not agitated; not disturbed.

UNRULED, a. *ŭn-rôld′:* not governed; not directed by superior power. UNRU′LY, a. disregarding restraint; disposed to violate laws; disorderly; ungovernable; refractory. UNRU′LINESS, a. disregard of restraint; turbulence. UNRU′LIMENT, n. *-lĭ-mĕnt,* in *OE.*, turbulence.

UNRUMPLE, v. *ŭn-rŭm′pl:* to free from rumples; to open out.

UNSADDLE, v. *ŭn-săd′dl:* to take the saddle from UNSAD′DLED, a. not having a saddle on.

UNSAFE, a. *ŭn-sāf′:* not safe; not free from danger; exposed to harm or destruction. UNSAFE′LY, ad. not without danger. UNSAFE′NESS, n. or UNSAFE′TY, n. state of not being free from danger; insecurity.

UNSAID, a. *ŭn-sĕd′:* not spoken or uttered.

UNSAINTLY, a. *ŭn-sānt′lĭ:* not like or becoming a saint.

UNSALABLE, a. *ŭn-sāl′ă-bl:* not salable; not in demand; not meeting a ready sale; unfit for sale; unmerchantable. UNSAL′ABLENESS, n. the state of being unsalable.

UNSALTED, a. *ŭn-sawlt′ĕd:* not pickled with salt; fresh.

UNSALUTED, a. *ŭn'să-lō'tĕd:* not saluted; not addressed with expressions of kind wishes; not greeted.

UNSANCTIFIED, a. *ŭn-săngk'tĭ-fīd:* unholy; not consecrated.

UNSANCTIONED, a. *ŭn-săngk'shŭnd:* not ratified; not approved; not authorized.

UNSANITARY, a. *ŭn-săn'ĭ-tĕr-ĭ:* not sanitary; tending to promote disease.

UNSATED, a. *ŭn-sā'tĕd:* not satisfied; not glutted.

UNSATISFACTORY, a. *ŭn-săt'ĭs-făk'tĕr-ĭ:* not giving satisfaction; causing discontent. UN'SATISFAC'TORILY, ad. UN'SATISFAC'TORINESS, n. the state or quality of being unsatisfactory. UNSAT'ISFI'ABLE, a. that cannot be satisfied UNSAT'ISFIED, a. not satisfied; not gratified to the full; not content; not convinced; not paid. UNSAT'ISFYING, a. not yielding full gratification; not giving content.

UNSAVORY, a. *ŭn-sā'vĕr-ĭ:* having a bad taste or smell; tasteless; unpleasing; disgusting; offensive. UNSA'VORILY, ad. UNSA'VORINESS, n. the state of being unsavory; bad taste or smell.

UNSAY, v. *ŭn-sā':* to retract; to deny something formerly declared.

UNSCALABLE, a. *ŭn-skāl'ă-bl:* that cannot be scaled or climbed.

UNSCANNED, a. *ŭn-skănd':* not scanned; not examined with care; not measured.

UNSCARED, a. *ŭn-skârd':* not frightened away.

UNSCARRED, a. *ŭn-skârd':* not marked with scars or wounds.

UNSCATHED, a. *ŭn-skāthť:* uninjured.

UNSCATTERED, a. *ŭn-skăt'tĕrd:* not scattered; not dispersed or thrown into confusion.

UNSCEPTRED, a. *ŭn-sĕp'tĕrd:* having no sceptre or royal authority; deprived of sovereign power.

UNSCHOLARLY, a. *ŭn-skŏl'ĕr-lĭ:* not suitable to or becoming a scholar. UN'SCHOLAS'TIC, a. not pertaining to schools; not pedantic. UNSCHOOLED', a. not taught; illiterate.

UNSCIENTIFIC, a. *ŭn-sī'ĕn-tĭf'ĭk:* not according to the principles of science; not versed in science. UNSCI'ENTIF'ICALLY, ad.

UNSCORCHED, a. *ŭn-skŏrcht':* not injured by fire, as the skin.

UNSCOURED, a. *ŭn-skowrd':* not cleaned by rubbing.

UNSCRATCHED, a. *ŭn-skrăcht':* not scratched; not rubbed or torn on the surface; not cancelled or erased.

UNSCREENED, a. *ŭn-skrēnd':* not screened; not covered; not sheltered or protected; not sifted.

UNSCREW, v. *ŭn-skrō':* to loose from screws; to unfasten or detach by screwing the other way.

UNSCRIPTURAL, a. *ŭn-skrĭp'tū-rŭl:* not in harmony or accordance with the Scriptures; not warranted by the authority of God's Word. UNSCRIP'TURALLY, ad.

UNSCRUPULOUS, a. *ŭn-skrō'pū-lŭs:* having no scruples; not particular as to means employed; not restrained by conscience. UNSCRU'PULOUSLY, ad. UNSCRU'PULOUSNESS, n. the state or quality of being unscrupulous.

UNSCULPTURED, a. *ŭn-skŭlp'tūrd:* not engraved; not cut in stone.

UNSEAL, v. *ŭn-sēl':* to break or remove the seal of; to open. UNSEAL'ING, imp. UNSEALED', pp.: ADJ. opened by breaking the seal; having no seal; wanting ratification.

UNSEARCHABLE, a. *ŭn-sĕrch'ă-bl:* that cannot be explored or investigated. UNSEARCH'ABLY, ad. UNSEARCH'ABLENESS, n. the state or quality of being beyond the power of man to explore. UNSEARCHED', a. not searched; not explored; not critically examined. UNSEARCHING, a. not penetrating.

UNSEARED, a. *ŭn-sērd':* not seared: not hardened.

UNSEASONABLE, a. *ŭn-sē'zn-ă-bl:* not in the proper season or time; not in keeping with the season; beyond the usual time; unfit; ill-timed; late. UNSEA'SONABLY, ad. at the wrong time or season; inopportunely. UNSEA'SONABLENESS, n. the quality or state of being not in season. UNSEA'SONED, a. not accustomed; not kept till fit for use, as wood; not inured; not salted; without added condiment, relish, or seasoning; unformed; not qualified by use; in *OE.*, unseasonable.

UNSEAT, v. *ŭn-sēt':* to throw from one's seat, as in the saddle; to depose from a seat or representative position, as to *unseat* a member of parliament for bribery. UNSEAT'ED pp.: ADJ. having no seat or bottom. UNSEAT'ING, imp. throwing or expelling from a seat.

UNSEAWORTHY, a. *ŭn-sē'wĕr-thĭ:* not fit for a voyage, applied to a ship which in respect of its equipment, state of repair, the soundness of its timbers, the number and efficiency of its crew, etc., is unfit for encountering the ordinary perils of the sea. UNSEA'WORTHINESS, n. the state of being unseaworthy.

UNSECONDED, a. *ŭn-sĕk'ŭn-dĕd:* not supported by any one but the mover, as a proposition or motion; not aided; not backed; in *OE.*, not again exemplified.

UNSECRET, a. *ŭn-sē'krĕt:* not secret or close; not trusty.

UNSECTARIAN, a. *ŭn'sĕk-tā'rĭ-ăn:* not sectarian or denominational.

UNSECULAR, a. *ŭn-sĕk'ū-lĕr:* not worldly. UNSEC'ULARIZE, v. to detach from the things of this world; to devote to sacred uses.

UNSECURED, a. *ŭn'sĕ-kūrd':* not secured.

UNSEDUCED, a. *ŭn'sĕ-dūst':* not seduced; not drawn to evil.

UNSEEMLY, a. *ŭn-sēm'lĭ:* not seemly or becoming; not decent: AD. in an unbecoming manner; indecently. UNSEEM'LINESS, n. indecency; uncomeliness; impropriety.

UNSEEN, a. *ŭn-sēn':* not seen or observed; not discovered; invisible.

UNSELFISH, a. *ŭn-sĕlf'ĭsh:* not unduly attached to one's own interests. UNSELF'ISHLY, ad. UNSELF'ISHNESS, n.

UNSENT, a. *ŭn-sĕnt':* not sent; not transmitted.

UNSEPARATED, a. *ŭn-sĕp'ă-rā-tĕd:* not detached or parted. UNSEP'ARABLE, a. *-ăr-ă-bl:* inseparable; that cannot be parted or divided.

UNSEPULCHRED, a. *ŭn-sĕp'ŭl-kĕrd:* having no grave; unburied.

UNSERVICEABLE, a. *ŭn-sĕr'vĭs-ă-bl:* not serviceable; useless. UNSER'VICEABLENESS, n. uselessness.

UNSET, a. *ŭn-sĕt':* not placed; not planted; not sunk below the horizon.

UNSETTLE, v. *ŭn-sĕt'tl:* to unfix; to make uncertain or fluctuating; to disconcert; to disorder; to discompose; to become unsettled. UNSET'TLED, pp.: ADJ. unfixed; unhinged; not determined; not arranged or adjusted; unsteady or wavering; fickle; having no fixed place of abode; turbid; not occupied by permanent inhabitants. UNSET'TLING, imp. UNSET'TLEDNESS, n. the state of being unfixed or undetermined; uncertainty; want of fixity. UNSET'TLEMENT, n unsettled state; irresolution.

UNSEVERED, a. *ŭn-sĕv'ĕrd:* not parted or divided.

UNSEX, v. *ŭn-sĕks':* to make otherwise than the sex commonly is; to deprive of qualities natural to the sex.

UNSHACKLE, v. *ŭn-shăk'l:* to unfetter; to undo or remove a shackle or shackles from; to set free. UNSHACK'LING, imp. UNSHACK'LED, pp. loosed from shackles or restraint.

UNSHADED, a. *ŭn-shā'dĕd:* not shaded, as a rough sketch; not shaded or obscured by having the light intercepted; not clouded. UNSHAD'OWED, a. *-shăd'ōd,* not darkened; not clouded.

UNSHAKEN, a. *ŭn-shā'kn:* not shaken; not agitated; not moved; not weakened in resolution; firm. UNSHAKED, pp. *ŭn-shākt',* in *O.E.*, unshaken.

UNSHAMED, a. *ŭn-shāmd':* not shamed.

UNSHAPE, v. *ŭn-shāp':* to deprive of shape; to confound; to throw into confusion. UNSHAPABLE, a. *ŭn shā'pă-bl,* that cannot be put into proper form. UNSHAPED', a., or UNSHA'PEN, a. deformed; ugly. UNSHAPE'LY, a. not well formed.

UNSHARED, a. *ŭn-shärd':* not shared.

UNSHAVED, a. *ŭn-shāvd':* not shaved.

UNSHEATHE, v. *ŭn-shēth':* to draw from the sheath or scabbard. UNSHEATH'ING, imp. UNSHEATHED', pp.

UNSHED, a. *ŭn-shĕd':* not shed: not spilled, as blood.

UNSHED, a. *ŭn-shĕd′:* not parted or divided, as the hair.

UNSHEETED, a. *ŭn-shēt′ĕd:* not covered with sheets or plates.

UNSHELTERED, a. *ŭn-shĕl′terd:* not sheltered; not defended from danger or annoyance; unscreened. UNSHEL′TERING, a. not protecting; not shielding from danger.

UNSHIELDED, a. *ŭn-shēld ĕd:* not shielded or protected; exposed.

UNSHIFTING, a. *ŭn-shĭft′ĭng:* not shifting; not changing place.

UNSHIP, v. *ŭn-shĭp′:* to remove from the place where it is settled or fixed, as to *unship* the tiller; also, to remove from a ship, as a cargo. UNSHIPPED′, pp. removed from its place in a ship.

UNSHOCKED, a. *ŭn-shŏkt′:* not shocked; not disgusted.

UNSHOD, a. *ŭn-shŏd′:* having no shoes.

UNSHORN, a. *ŭn-shōrn′:* not sheared or clipped.

UNSHOT, a. *ŭn-shŏt′:* not hit by shot; not discharged: V. to take the balls out of, as out of guns.

UNSHOUT, v. *ŭn-showt′:* in *OE.*, to retract what is agreed to by a shout.

UNSHOWERED, a. *ŭn-show′ĕrd:* not watered by showers of rain.

UNSHRINKING, a. *ŭn-shrĭngk′ĭng:* not shrinking; not withdrawing from danger or toil; not recoiling. UNSHRINK′INGLY, ad.

UNSHRIVEN, a. *ŭn-shrĭv′n:* not absolved, as by a confession of sins.

UNSHROUDED, a. *ŭn-shrowd′ĕd:* not shrouded; not covered; unveiled.

UNSHRUNK, a. *ŭn-shrŭngk′:* not contracted; not sponged, as cloth.

UNSHUNNED, a. *ŭn-shŭnd′:* not avoided. UNSHUN′NABLE, a. *-nă-bl,* that cannot be shunned; inevitable.

UNSHUT, a. *ŭn-shŭt′:* open; unclosed.

UNSIFTED, a. *ŭn-sĭft′ĕd:* not sifted; not separated by a sieve; untried.

UNSIGHTLY, a. *ŭn-sīt′lĭ:* disagreeable to the eye; deformed. UNSIGHT′LINESS, n. the state of being unsightly; ugliness.

UNSILVERED, a. *ŭn-sĭl′vĕrd:* not covered with silver or quicksilver.

UNSINEWED, a. *ŭn-sĭn′ūd:* deprived of strength or force.

UNSINGED, a. *ŭn-sĭnjd′:* not singed; not scorched.

UNSINNING, a. *ŭn-sĭn′nĭng:* committing no sin; not tainted with sin.

UNSISTERLY, a. *ŭn-sĭs′tĕr-lĭ:* not becoming a sister.

UNSIZED, a. *ŭn-sīzd′:* not sized or stiffened.

UNSKILFUL, a. *ŭn-skĭl'fŭl:* wanting the knowledge and dexterity which are acquired by experience; clumsy. UNSKIL'FULLY, ad. UNSKIL'FULNESS, n. want of dexterity and readiness in action or execution, which are acquired by experience. UNSKILLED', a. destitute of practical knowledge. UNSKILLED LABOR, labor which involves no mental strain or skill.

UNSLACKENED, a. *ŭn-slăk'nd:* not slackened.

UNSLAKED, a. *ŭn-slākt':* not quenched, as thirst; not saturated with water, as lime.

UNSLEEPING, a. *ŭn-slēp'ĭng:* ever wakeful and watchful.

UNSLING, v. *ŭn-slĭng':* to unloose from slings or fastenings, as a swung cask.

UNSLIPPING, a. *un-slĭp'pĭng:* not liable to slip; fast.

UNSMIRCHED, a. *ŭn-smĕrcht':* not polluted; not stained.

UNSMOKED, a. *ŭn-smōkt':* not smoked; not dried in smoke; not used in smoking, as a pipe.

UNSMOOTH, a. *ŭn-smŏth':* not even; rough; not level. UNSMOOTHED', a. not made smooth or even.

UNSOCIABLE, a. *ŭn-sō-shă-bl:* lacking the qualities and manners which render one agreeable in society; lacking sociability; averse to or unfitted for society; reserved; not easy in conversation. UNSO'CIABLY, ad. not kindly; with reserve. UNSO'CIABLENESS, n , or UNSO'CIABIL'ITY, n. *-bĭl'ĭ-tĭ,* the state of being unsociable. UNSO'CIAL, a. not adapted by qualities and manners to be agreeable in society.

UNSOILED, a. *ŭn-soyld':* not soiled; not stained; unpolluted; not tainted.

UNSOLD, a. *ŭn-sōld':* not sold; not disposed of by sale.

UNSOLDIERLY, a. *ŭn-sōl'jĕr-lĭ,* or UNSOL'DIERLIKE, a.: unbecoming a soldier.

UNSOLICITED, a. *ŭn'sō-lĭs'ĭ-tĕd:* not solicited; not requested; unasked. UN'SOLIC'ITOUS, a. not anxious; not very desirous.

UNSOLVED, a. *ŭn-sŏlvd':* not solved; not explained. UNSOL'VABLE, a. *-vă-bl,* that cannot be solved; inexplicable.

UNSOPHISTICAL, a. *ŭn'sŏ-fĭs'tĭ-kăl:* not sophisticated; rustic; simple; ignorant. UN'SOPHIS'TICATED, a. genuine; pure; simple; not adulterated by admixture.

UNSORROWED, a. *ŭn-sŏr'rōd:* not lamented; not bewailed; with *for,* as a death *unsorrowed for.*

UNSORTED, a. *ŭn-sŏrt'ĕd:* not separated into kinds or classes; in *OE.,* ill chosen; ill arranged; unsuitable.

UNSOUGHT, a. *ŭn-sawt':* not sought; not requested; not solicited; not explored.

UNSOULED, a. *ŭn-sōld':* divested of soul or mind without soul or honor

UNSOUND, a. *ŭn-sownd':* not sound; defective; infirm; sickly; diseased; not orthodox; not solid; not real; not substantial; invalid; not fast under foot; not well established. UNSOUND'LY, ad. UNSOUND'NESS, n. the state of being unsound or defective; corruptness; want of solidity; want of orthodoxy; weakness or sickliness of body. UNSOUND'ED, a. not sounded; unfathomed; unfathomable. UNSOUND'ABLE, that cannot be fathomed.—SYN. of 'unsound': rotten; decayed; unorthodox; heterodox; dishonest; untrue; insincere; erroneous; wrong.

UNSOURED, a. *ŭn-sowrd':* not made sour or morose.

UNSOWN, a. *ŭn-sōn',* or UNSOWED', a.: not sown, as land; not propagated by seed being scattered.

UNSPARING, a. *ŭn-spär'ĭng:* profuse; liberal; no parsimonious; not merciful. UNSPAR'INGLY, ad. in abundance; lavishly. UNSPARED', a. *-spärd'.*

UNSPEAK, v. *ŭn-spēk':* to retract; to unsay; to recant. UNSPEAKABLE, a. *ŭn spēk'ă-bl,* that cannot be spoken or uttered; that cannot be expressed in words; unutterable. UNSPEAK'ABLY, ad. in a manner or degree that cannot be expressed; unutterably.

UNSPECIFIED, a. *ŭn-spĕs'ĭ-fīd:* not particularly mentioned.

UNSPECULATIVE, a. *ŭn-spĕk'ū-lā-tĭv:* not speculative; not given to forming theories; not apt to engage in trading ventures.

UNSPENT, a. *ŭn-spĕnt':* not spent; not used or wasted; not exhausted; not deprived of its force, as an *unspent* ball.

UNSPHERE, v. *ŭn sfēr':* to remove from its orb.

UNSPIED, a. *ŭn-spīd':* not seen; not discovered; not searched or explored.

UNSPILT, a. *ŭn-spĭlt':* not spilled or shed.

UNSPIRITUAL, a. *ŭn-spĭr'ĭt-ū-ăl:* not spiritual; carnal. UNSPIR'ITUALIZE, v. *-īz,* to deprive of spirituality.

UNSPLIT, a. *ŭn-splĭt':* not split; not riven or rent in length.

UNSPOILED, a. *ŭn-spoyld':* not spoiled; not rendered useless; not corrupted; not plundered.

UNSPOKEN, a. *ŭn-spō'kn:* not spoken or uttered.

UNSPOTTED, a. *ŭn-spŏt'tĕd:* not spotted or stained; untainted with guilt; unblemished; immaculate; pure. UNSPOT'TEDNESS, n. state of being free from stain or guilt.

UNSQUARED, a. *ŭn-skwärd':* not formed with lines or right angles; undressed, as round or natural timber; not regular.

UNST, *ŭnst:* most n. of the Shetland Islands, lat. 60° 45′ n., 12 m. long, and 3½ m. in average breadth; 36 sq. m. The coast is much broken, and the headlands are rocky, mural, and lofty. Valuable minerals abound, and chromate of iron is an article of commerce. The island contains numerous tumuli, a chain of Scandinavian dunes, and the ruins of more than 20 ancient chapels. Fishing and agriculture are chief employments. Pop. (1881) 2,173.

UNSTABLE, a. *ŭn-stā'bl:* not steady; inconstant; irresolute; wavering. UNSTA'BLENESS, n. instability.

UNSTAID, a. *ŭn-stād':* not steady; volatile; mutable; unfixed. UNSTAID'NESS, n. *-nĕs,* volatile mind; uncertain motion.

UNSTAINED, a. *ŭn-stānd':* not dyed; not polluted; not dishonored.

UNSTAMPED, a. *ŭn-stămpt':* not stamped or impressed; not having a stamp, as a letter, deed, etc.

UNSTANCHED, a. *ŭn-stânsht':* not stanched; not stopped, as blood.

UNSTATE, v. *ŭn-stāt':* t divest of state or dignity.

UNSTATESMANLIKE, a. *ŭn-stāts'măn-līk:* not becoming a statesman.

UNSTATUTABLE, a. *ŭn-stăt'ū-tū-bl:* contrary to statute.

UNSTAUNCHED: same as UNSTANCHED.

UNSTAYED, a. *ŭn-stād':* not stopped or retarded.

UNSTEADFAST, a. *ŭn-stĕd'făst:* not fixed; not firm; inconstant.

UNSTEADY, a. *ŭn-stĕd'ĭ:* not constant; irresolute. changeable; mutable; variable; addicted to some vice. UNSTEAD'IED, a. not supported; not kept from shaking; UNSTEAD'ILY, ad. UNSTEAD'INESS, n. inconstancy; want of firmness; irresolution.

UNSTEEPED, a. *ŭn-stēpt':* not soaked.

UNSTIMULATED, a. *ŭn-stĭm'ū-lā-tĕd:* not stimulated; not excited to action or to more vigorous exertion.

UNSTINTED, a. *ŭn-stĭnt'ĕd:* not stinted; not restrained within certain limits.

UNSTIRRED, a. *ŭn-stĕrd':* not stirred; not agitated.

UNSTOOPING, a. *ŭn-stôp'ĭng:* not stooping; not bending; not yielding.

UNSTOP, v. *ŭn-stŏp':* to take out a stopper from; to free from being stopped; to open. UNSTOP'PING, imp. UNSTOPPED', pp.: ADJ. not meeting any resistance.

UNSTORED, a. *ŭn-stōrd':* not stored; not laid up for future use; not warehoused.

UNSTORMED, a *ŭn-stawrmd':* not stormed; not taken by assault, as a fortified place.

UNSTRAINED, a. *ŭn-strānd':* not strained; easy; not forced; natural.

UNSTRAITENED, a. *ŭn-strāt'nd:* not straitened; not contracted.

UNSTRATIFIED, a. *ŭn-străt'ĭ-fīd:* in *geol.,* not stratified; not formed or arranged in layers or strata, but in amorphous masses.

UNSTRENGTHENED, a. *ŭn-strĕngth'nd:* not strengthened; not supported.

UNSTRING, v. *ŭn-strĭng′:* to take strings from; to relax, as the strings of a musical instr.; to loosen, as the nerves; to take from a string, as beads; to untie. UNSTRINGED′, pp.: ADJ. not having strings. UNSTRING′ING, imp. UNSTRUNG′, pt. pp.

UNSTRUCK, a. *ŭn-strŭk′:* not struck; not impressed; not affected.

UNSTUDIED, a. *ŭn-stŭd′ĭd:* not premeditated or prepared beforehand; easy; natural; ignorant through neglect of study. UNSTUDIOUS, a. *ŭn-stū′dĭ-ŭs,* not diligent in study.

UNSTUFFED, a. *ŭn-stŭft′:* not stuffed.

UNSUBDUED, a. *ŭn′sŭb-dūd′:* not brought into subjection; not conquered.

UNSUBMISSIVE, a. *ŭn′sŭb-mĭs′sĭv:* not yielding to the will or power of another; disobedient. UN′SUBMIS′SIVELY, ad.

UNSUBSCRIBED, a. *ŭn′sŭb-skrībd′:* not subscribed; not attested or agreed to by writing one's name beneath.

UNSUBSTANTIAL, a. *ŭn′sŭb-stăn′shăl:* not solid; not real; slight; flimsy. UN′SUBSTAN′TIALLY, ad. UN′SUBSTAN′TIAL′ITY, n. *-shĭ-ăl′ĭ-tĭ,* quality of being unsubstantial, or of having no real existence. UN′SUBSTAN′TIATED, a. not established by proof; not verified.

UNSUCCESSFUL, a. *ŭn′sŭk-sĕs′fŭl:* not successful; not accomplishing what was intended or expected; not fortunate. UN′SUCCESS′FULLY, ad. UN′SUCCESS′FULNESS, n. the state of being unsuccessful. UN′SUCCESS′, n. want of success.

UNSUCKED, a. *ŭn-sŭkt′:* not sucked.

UNSUFFERABLE, a. *ŭn-sŭf′fĕr-ă-bl:* intolerable; insufferable.

UNSUITABLE, a. *ŭn-sūt′ă-bl:* unfit; not adapted; improper. UNSUIT′ABLY, ad. UNSUIT′ABLENESS, n. the state of being unsuitable. UNSUIT′ED, a. not suited; not adapted. UNSUIT′ING, a. not fitting; not becoming.

UNSULLIED, a. *ŭn-sŭl′lĭd:* not stained; not tarnished; not disgraced.

UNSUNG, a. *ŭn-sŭng′:* not sung; not celebrated in verse.

UNSUNNED, a. *ŭn-sŭnd′:* not exposed to the sun; not thawed by the sun.

UNSUPPLANTED, a. *ŭn′sŭp-plănt′ĕd:* not supplanted; not displaced or undermined; not overthrown by stratagem.

UNSUPPLIED, a. *ŭn′sŭp-plīd′:* not supplied; not furnished with what is necessary.

UNSUPPORTABLE, a. *ŭn′sŭp-pōrt′ă-bl:* intolerable; such as cannot be endured; insupportable. UN′SUPPORT′ED, a. not upheld; not sustained; not seconded.

UNSUPPRESSED, a. *ŭn′sŭp-prĕst′:* not suppressed; not subdued; not extinguished.

UNSURE, a. *ŭn-sūr′:* not sure; not fixed; not certain. UNSURED′, a. in *OE.*, not fixed or certain.

UNSURMOUNTABLE, a. *ŭn′sĕr-mownt′ă-bl:* that cannot be overcome; insuperable; insurmountable.

UNSURPASSED, a. *ŭn′sĕr-păst′:* not surpassed; not excelled; not exceeded.

UNSURRENDERED, a. *ŭn′sĕr-rĕn′dĕrd:* not surrendered.

UNSUSCEPTIBLE, a. *ŭn′sŭs-sĕp′tĭ-bl:* not susceptible.

UNSUSPECTED, a. *ŭn′sŭs-pĕkt′ĕd:* not suspected. UN′SUSPECT′ING, a unsuspicious; not imagining that any ill is designed. UN′SUSPECT′INGLY, ad. UNSUSPECT′, a. OE. for UNSUSPECTED.

UNSUSPENDED, a. *ŭn′sŭs-pĕnd′ĕd:* not hung up; not suspended, intermitted, or delayed.

UNSUSPICIOUS, a. *ŭn′sŭs-pĭsh′ŭs:* not inclined to mistrust others; not imagining evil in others; not to be suspected, as evidence. UN′SUSPI′CIOUSLY, ad. not in such a way as to imagine evil in others; without suspicion. UNSUSPI′CION, n. *-pĭsh′ŭn,* absence of suspicion.

UNSUSTAINABLE, a. *ŭn′sŭs-tān′ă-bl:* that cannot be maintained. UN′SUSTAINED′, a. not supported. UN′SUSTAIN′ING, a. not sustaining; not keeping from falling.

UNSWATHE, v. *ŭn-swāth′:* to free, as from the encircling folds of bandages.

UNSWAYED, a. *ŭn-swād′:* not swayed; not controlled or influenced; not biassed. UNSWAY′ABLE, a. *-ă-bl,* that cannot be swayed or influenced; not to be governed.

UNSWEAR, v. *ŭn-swär′:* to retract or recant by an oath.

UNSWEET, a. *ŭn-swēt′:* not sweet; disagreeable.

UNSWEPT, a. *ŭn-swĕpt′:* not swept; not cleaned with a broom.

UNSWERVING, a. *ŭn-swĕrv′ĭng:* not swerving or deviating from a direct course; constant. UNSWERV′INGLY, ad.

UNSWORN, a. *ŭn-swōrn′:* not bound by an oath; not having taken an oath.

UNSWUNG, a. *ŭn-swŭng′:* not suspended.

UNSYMMETRICAL, a. *ŭn′sĭm-mĕt′rĭ-kăl:* lacking symmetry or due proportion of parts.

UNSYSTEMATIC, a. *ŭn-sĭs′tĕm-ăt′ĭk,* or UNSYS′TEMAT′ICAL, a.: not systematic; without regular order or arrangement of parts.

UNTAINTED, a. *ŭn-tānt′ĕd:* not tainted or rendered impure by admixture of foul matter; not stained; unblemished. UNTAINT′EDLY, ad. UNTAINT′EDNESS, n. the state of being untainted.

UNTAINTED, a. *ŭn-tānt′ĕd:* in *OE.*, not attainted.

UNTAKEN, a. *ŭn tā′kn:* not taken; not captured or reduced; not subdued; not swallowed.

UNTAMABLE, a. *ŭn-tā'mă-bl:* not tamable; that can not be reclaimed from a wild state. UNTAMED', a. not reclaimed from wildness; not domesticated; not brought under control.

UNTANGLE, v. *ŭn-tăng'gl:* to loose from intricacy or a knotty condition; to disentangle.

UNTARNISHED, a. *ŭn-târ'nĭsht:* not soiled; not stained; unblemished.

UNTASTED, a. *ŭn-tāst'ĕd:* not tasted; not tried by the sense of taste or by the tongue; not experienced. UNTAST'ING, a. not tasting; not perceiving by the taste.

UNTAUGHT, a. *ŭn-tawt':* not taught; not instructed, unlettered; unskilled; ignorant.

UNTAXED, a. *ŭn-tăkst':* not charged with taxes; not accused.

UNTEACHABLE, a. *ŭn-tēch'ă-bl:* that cannot be taught or instructed. UNTEACH', v. to cause to forget what has been taught; to cause to be forgotten.

UNTEMPERED, a. *ŭn-tĕm'pĕrd:* not tempered; not duly mixed for use; rigorous.

UNTEMPTED, a. *ŭn-tĕm'tĕd:* not tempted; not tried by enticements or persuasions. UNTEMPT'ING, a. not adapted to tempt or allure.

UNTENABLE, a. *ŭn-tĕn'ă-bl:* that cannot be held in possession; not defensible.

UNTENANTABLE, a. *ŭn-tĕn'ănt-ă-bl:* not in suitable repair for a tenant; not fit for habitation. UNTEN'ANTED, a. not occupied, as a house.

UNTENDED, a. *ŭn-tĕn'dĕd:* not tended; not attended to or cared for; not having an attendant.

UNTENDER, a. *ŭn-tĕn'dĕr:* not soft; lacking in sensibility or affection.

UNTENDERED, a. *ŭn-tĕn'dĕrd:* not offered.

UNTENT, v. *ŭn-tĕnt':* in *OE.*, to bring out of a tent; to deprive of the shelter of a tent. UNTENTED, a. *ŭn-tĕnt'ĕd,* without the shelter of a tent; not covered with tents.

UNTENTED, a. *ŭn-tĕnt'ĕd* [see TENT 1]: having no lint or medical dressings applied.

UNTERRIFIED, a. *ŭn-tĕr'rĭ-fīd:* not affrighted or daunted.

UNTERWALDEN, *ûn-tĕr-vâl'dĕn:* one of the four Forest Cantons of Switzerland; part of the Hill Country which surrounds the Lake of Lucerne (see SWITZERLAND); 25 m. in length, U. is bounded e., s., and w. by lofty hills, and subsidiary ridges divide it into two parallel valleys—both of which open on the north into the Lake of Lucerne. The e. valley is drained by the Engelberger Aa, the w. by the Sarner Aa. Great highways run up these valleys from the shores of the lake, connecting with each other; but not connecting U. with surrounding cantons. The canton is chiefly pastoral. Attempts to cultivate the vine have not been successful. The language of the people is a Swiss-

German dialect; their religion is Rom. Catholic. U. is divided into two parts; not, however, corresponding with the two river basins of which it is formed. The forest of Kerns, or Kernwald, formed the line of separation between these two districts as early as 1150. One is named the Obwald, or district above the Forest, and includes the whole w. valley. The other is the Nidwald, including only the lower part of the e. valley. Each division forms an independent republic, with its own administration. Both have a *landesgemeinde,* or parliament, composed of all the inhabitants 20 years of age, except a few *heimathlosen* (tramps); and each forms a half-canton, i.e., a canton which returns one member to the Swiss council of state. The landesgemeinde of each half-canton assembles in the open air late in the spring, when it passes new laws, pays off accounts, imposes taxes, and appoints the executory officers. —The cap. of the Nidwald is Stanz (pop. est. at 2,500); remarkable for its fine church and statue of Winkelried. The cap. of the Obwald is Sarnen (pop. about 4,000).—Pop. of U. (1888) 27,585; (1900) 28,330.

UNTESTED, a. *ŭn-tĕst'ĕd:* not tested or proved; not tried by a standard.

UNTHANKED, a. *ŭn-thăngkt':* not thanked; not repaid with acknowledgments. UNTHANK'FUL, a. not making acknowledgments for favors received; ungrateful. UNTHANK'FULLY, ad. UNTHANK'FULNESS, n. neglect of acknowledgments for good received; ingratitude.

UNTHAWED, a. *ŭn-thawd':* not melted or dissolved.

UNTHEORETICAL, a. *ŭn-thē'ō-rĕt'ĭ-kăl:* not depending on theory or speculation.

UNTHINK, v. *ŭn-thĭngk':* to recall or dismiss in thought; dismiss from the mind. UNTHINKING, a. *ŭn-thĭngk'ĭng,* thoughtless; inconsiderate. UNTHINK'INGLY, ad. UNTHOUGHT'FUL, a. inconsiderate; heedless. UNTHOUGHT'OF, a. not thought of; not regarded.

UNTHREAD, v. *ŭn-thrĕd':* to draw a thread from, as to *unthread* a needle; to loose; relax.

UNTHREATENED, a. *ŭn-thrĕt'nd:* not threatened or menaced.

UNTHRIFT, n. *ŭn'thrĭft:* lack of thrift; extravagance; prodigality; one who wastes his substance by extravagance: ADJ. *ŭn-thrĭft',* in *OE.,* prodigal; profuse. UNTHRIFT'Y, a. prodigal; lavish; profuse; wasteful. UNTHRIFT'ILY, ad. UNTHRIFT'INESS, n. the state of being unthrifty.

UNTHRONE, v. *ŭn-thrōn':* to pull down from a throne; to dethrone.

UNTIDY, a. *ŭn-tī'dĭ:* not tidy; not neatly dressed; not in good order. UNTI'DILY, ad. UNTI'DINESS, n. the state of being untidy; want of order or neatness.

UNTIE, v. *ŭn-tī':* to undo, as a knot; to undo the fastenings or wrappings of; to free from a knot or any fastening; to unbind; to loosen; to disentangle. UNTIED', pp.: ADJ. not bound or gathered in a knot; not held by any fastening; set free from any bond.

UNTIL, prep. *ŭn-tĭl'* [OS. *und*, unto, and Ger. *ziel;* OHG. *zil;* Bohem. *cyl*, a bound, a limit, an end]: to; till; as far as, with respect to time, but in early English used also in respect of place: CONJ. as far as; to the point that; to the degree or time that.

UNTILLED, a. *ŭn-tĭld':* not tilled or cultivated.

UNTIMBERED, a. *ŭn-tĭm'bĕrd:* not growing timber, as *untimbered* land; in *OE.*, not furnished with timber; weak.

UNTIMELY, a. *ŭn-tīm'lĭ:* not timely; inopportune; happening before the usual or natural time; premature: AD. before the natural or proper time. UNTIME'LINESS, n. the state of being untimely. UNTIME'OUS, a. *-ŭs*, untimely. UNTIME'OUSLY, ad.

UNTINCTURED, a. *ŭn-tĭngk'tūrd:* not impregnated with; not imbued with, as the mind.

UNTINGED, a. *ŭn-tĭnjd':* not tinged; not stained; not discolored; not infected.

UNTIRED, a. *ŭn-tīrd':* not tired; not exhausted; not made weary. UNTIR'ING, a. not becoming weary or fatigued. UNTIR'INGLY, ad. UNTIR'ABLE, a. *-ă-bl*, in *OE.*, incapable of being tired; unwearied.

UNTITLED, a. *ŭn-tī'tld:* having no title or claim; having no title of honor, dignity, or office; lacking title, as an *untitled* person.

UNTO, prep. *ŭn'tû* [OS. and Goth. *und*, unto, and Eng. *to*]: to: now used only in formal or scriptural language.

UNTOLD, a. *ŭn-tōld':* not told; not related; not revealed; not numbered, or that cannot be told or numbered.

UNTOUCHED, a. *ŭn-tŭcht':* not touched; not hit; not moved or affected; not meddled with.

UNTOWARD, a. *ŭn-tō'ĕrd:* perverse; not easily guided or taught; troublesome; in *OE.*, awkward; ungraceful; in *prov. Eng.*, wild; fierce. UNTO'WARDLY, ad. in a froward or perverse manner: ADJ. perverse; awkward. UNTO'WARDNESS, n. perverseness; awkwardness.

UNTRACEABLE, a. *ŭn-trās'ă-bl:* that cannot be traced; that cannot be followed by footsteps or tracks. UNTRACED', a. not traced; not marked out or delineated; not marked by footsteps.

UNTRACKED, a. *ŭn-trăkt':* not tracked; not marked or followed by footsteps.

UNTRACTABLE, a. *ŭn-trăkt'ă-bl:* not tractable; not yielding to management; stubborn; rough; difficult. UNTRACT'ABLENESS, or UNTRACT'ABIL'ITY, n. *-bĭl'ĭ-tĭ*, the state or quality of being untractable; stubbornness.

UNTRAINED, a. *ŭn-trānd':* not trained; not disciplined; not skilful; not educated.

UNTRANSCRIBED, a. *ŭn'trăn-skrībd':* not copied; not written over again.

UNTRANSFERABLE, a. *ŭn'trăns-fĕr'ă-bl:* that cannot be passed to another. UN'TRANSFERRED', a. not transferred; not conveyed or assigned to another.

UNTRANSLATABLE, a. *ŭn'trăns-lā'tá-bl:* not capable of being translated. UN'TRANSLA'TED, a. not translated.

UNTRANSMUTABLE, a. *ŭn'trăns-mū'tă-bl:* that cannot be transmuted or changed in nature or substance.

UNTRANSPORTED, a. *ŭn'trăns-pōrt'ĕd:* not transported; not conveyed from one place to another.

UNTRANSPOSED, a. *ŭn'trăns-pōzd':* not transposed; having the natural order.

UNTRAVELLED, a. *ŭn-trăv'ĕld:* not trodden by passengers; not having visited foreign countries.

UNTREAD, v. *ŭn-trĕd:* in *OE.*, to go back in the same steps; to tread back; retrace.

UNTREASURED, a. *ŭn-trĕzh'ûrd:* not laid up; in *OE.*, deprived of treasure.

UNTRIED, a. *ŭn-trīd':* not attempted; not tested or proved; without experience; inexperienced; not having passed trial; not heard and determined in a court of law.

UNTRIMMED, a. *ŭn-trĭmd':* not trimmed; not pruned or dressed, as a bush.

UNTRITURATED, a. *ŭn-trĭt'ū-rā'tĕd:* not reduced to powder.

UNTROD, a. *ŭn-trŏd'*, or UNTRODDEN, a. *ŭn-trŏd'n:* not passed over by persons; not marked by the feet.

UNTROUBLED, a. *ŭn-trŭb'ld:* not troubled; not disturbed by care or business; not agitated; not foul or turbid; transparent. UNTROUB'LEDNESS, n. state of being untroubled; indifference.

UNTRUE, a. *ŭn-trô':* contrary to the fact; false; not faithful or true to another. UNTRU'LY, ad. falsely.

UNTRUSSED, a. *ŭn-trŭst':* not trussed; not tied up.

UNTRUSTWORTHY, a. *ŭn-trŭst'wĕr-thĭ:* not deserving of confidence.

UNTRUSTY, a. *ŭn-trŭst'ĭ:* not trusty; not worthy of confidence; unfaithful. UNTRUST'INESS, n. the state of being untrusty. UNTRUST'ED, a. not confided in.

UNTRUTH, n. *ŭn-trôth':* falsity; a falsehood; something not in conformity to fact and reality; want of fidelity; treachery. UNTRUTH'FUL, a. not truthful; having the habit of uttering falsehoods; not speaking the truth. UNTRUTH'FULLY, ad.

UNTUNABLE, a. *ŭn-tū'nă-bl:* that cannot be tuned; not harmonious; not musical. UNTU'NABLY, ad. UNTUNE, v. *ŭn-tūn'*, to make incapable of harmony; to disorder. UNTUNED', a. made incapable of producing harmonious sounds; discordant.

UNTURNED, a. *ŭn-tĕrnd':* not turned.

UNTUTORED, a. *ŭn-tū'tĕrd:* uninstructed; untaught.

UNTWINE, v. *ŭn-twīn':* to unwind; to loose that which has been twined. UNTWINED', a. untwisted; disentangled.

UNTWIST, v. *ŭn-twĭst':* to separate that which has been twisted; to open; to disentangle; to untwine. UNTWIST'ING, imp. UNTWIST'ED, a. separated; opened.

UNURGED, a. *ŭn-ĕrjd':* not urged; not incited; not pressed with entreaty.

UNUSED, a. *ŭn-ūzd':* not employed; not handled for some purpose; that has never been used; left over; not habituated or accustomed. UNUSE'FUL, a. unprofitable; useless. UNU'SUAL, a. not usual; not common. UNU'SUALLY, ad. UNU'SUALNESS, n. the state of being unusual or uncommon.

UNUTTERABLE, a. *ŭn-ŭt'ĕr-ă-bl:* that cannot be expressed in words; that cannot be disclosed; unspeakable UNUT'TERABLY, ad.

UNVACATED, a. *ŭn-vā'kā-tĕd:* not made vacant.

UNVALUED, a. *ŭn-văl'ūd:* not valued; not appraised, not prized; neglected; in *OE.*, inestimable; above price.

UNVANQUISHED, a. *ŭn-văn'kwĭsht:* not overcome; not conquered.

UNVARIED, a. *ŭn-vā'rĭd:* not varied; not altered or diversified.

UNVARIEGATED, a. *ŭn-vā'rĭ-ē-gā-tĕd:* not variegated; not diversified.

UNVARNISHED, a. *ŭn-vär'nĭsht:* not varnished; not artificially colored or adorned; plain, as an *unvarnished* tale.

UNVARYING, a. *ŭn-vā'rĭ-ĭng:* that does not vary; not liable to change.

UNVEIL, v. *ŭn-vāl':* to uncover; to disclose to view UNVEIL'ING, imp. UNVEILED', pp.

UNVENERABLE, a. *ŭn-vĕn'ĕr-ă-bl:* in *OE.*, not venerable or worthy of veneration or respect.

UNVENTILATED, a. *ŭn-vĕn'tĭ-lā-tĕd:* not ventilated not purified by a free current of air; not subjected to public discussion.

UNVERSED, a. *ŭn-vĕrst':* not skilled; unacquainted.

UNVEXED, a. *ŭn-vĕkst':* untroubled; not annoyed or disturbed.

UNVINDICATED, a. *ŭn-vĭn'dĭ-kā-tĕd:* not vindicated.

UNVIOLATED, a. *ŭn-vī'ō-lā-tĕd:* not violated; not broken; not injured; not transgressed

UNVIRTUOUS, a. *ŭn-vĕr'tū-ŭs:* wanting virtue.

UNVISITED, a. *ŭn-vĭz'ĭ-tĕd:* not visited; not resorted to; not frequent.

UNVITIATED, a. *ŭn-vĭsh'ĭ-ā-tĕd:* not vitiated; not corrupted; not injured in its substance or qualities.

UNVITRIFIED, a. *ŭn-vĭt'rĭ-fīd:* not converted into glass.

UNVOICED, a. *ŭn-voyst':* not spoken or pronounced.

UNVOUCHED, a. *ŭn-vowcht':* not affirmed or fully tested.

UNVOWED, a. *ŭn-vowd′:* not vowed; not consecrated by promise.

UNVOYAGEABLE, a. *ŭn-voy′ăj-ă-bl:* in *OE.*, that cannot be navigated, crossed, travelled, or passed over.

UNWAKENED, a. *ŭn-wā′knd:* not wakened; not roused from sleep or stupidity.

UNWALLED, a. *ŭn-wawld′:* not surrounded or protected by a wall.

UNWARES, ad. *ŭn-wärz′* [see AWARE and WARY]: unexpectedly; unawares.

UNWARILY, UNWARINESS: see under UNWARY.

UNWARLIKE, a. *ŭn-wawr′līk:* not fit for war; not used to war; peace-loving.

UNWARMED, a. *ŭn-wawrmd′:* not warmed; not excited; not heated in a moderate degree.

UNWARNED, a. *ŭn-wawrnd′:* not cautioned; not previously admonished of danger.

UNWARP, v. *ŭn-wawrp′:* to reduce from the state of being warped. UNWARPED′, a. not warped; not biased; impartial. UNWARP′ING, a. unyielding; undeviating.

UNWARRANTABLE, a. *ŭn-wŏr′rănt-ă-bl:* not justifiable; unjust; improper. UNWAR′RANTABLY, ad. in a manner that cannot be justified. UNWAR′RANTABLENESS, n. the state of being unwarrantable. UNWAR′RANTED, a. not warranted; not authorized; not assured or certain; not guaranteed to be sound and perfect, or of a certain quality.

UNWARY, a. *ŭn-wā′rĭ:* not cautious; not vigilant against danger; in *OE.*, unforeseen; unexpected. UNWA′RILY, ad. without vigilance or caution; heedlessly. UNWA′RINESS, n. want of caution; carelessness.

UNWASHED, a. *ŭn-wŏsht′*, or UNWASH′EN, a.: not washed or cleansed by water. THE UNWASHED, or THE GREAT UNWASHED, the mob; the rabble.

UNWASTED, a. *ŭn-wāst′ĕd:* not lost by extravagance or negligence; not lost by preventable means. UNWAST′ING, a. *-ĭng*, not growing less; not decaying.

UNWATCHED, a. *ŭn-wŏcht′:* not watched; not guarded. UNWATCH′FUL, a. not watchful; not vigilant. UNWATCH′FULNESS, n. want of caution or vigilance.

UNWATERED, a. *ŭn-waw′tĕrd:* not watered, as by a river; not covered or wet with water; dry.

UNWAVERING, a. *ŭn-wā′vĕr-ĭng:* not unstable; not fluctuating; firm.

UNWEAKENED, a. *ŭn-wēk′nd:* not weakened; not enfeebled.

UNWEANED, a. *ŭn-wēnd′:* not weaned.

UNWEAPONED, a. *ŭn-wĕp′nd:* not furnished with weapons.

UNWEARIABLE, a. *ŭn-wēr'ĭ-ă-bl:* that cannot be wearied or tired out. UNWEAR'IABLY, ad. UNWEAR'IED, a. not tired; not fatigued; that does not tire or sink under fatigue or exertion. UNWEAR'IEDLY, ad. UNWEAR'IEDNESS, n. state or quality of being unwearied. UNWEAR'Y, a. not tired.

UNWEAVE, v. *ŭn-wēv':* to undo what has been woven.

UNWED, a. *ŭn-wĕd',* or UNWED'DED, a.: unmarried; single.

UNWEDGEABLE, a. *ŭn-wĕj'ă-bl:* not easily split or cloven.

UNWEEDED, a. *ŭn-wēd'ĕd:* not cleared of weeds.

UNWEETING, a. *ŭn-wēt'ĭng* [AS. *un,* not; *witan,* to perceive, to know (see WIT)]: in *OE.,* unknowing; ignorant. UNWEET'INGLY, ad. OE. for UNWITTINGLY; ignorantly.

UNWEIGHED, a. *ŭn-wād':* not weighed; not deliberately considered and examined; inconsiderate. UNWEIGH'ING, a. inconsiderate; thoughtless.

UNWELCOME, a. *ŭn-wĕl'kŭm:* not welcome; not well received; not pleasing. UNWEL'COMELY, ad. UNWEL'COMED, a. not willingly and gladly received.

UNWELL, a. *ŭn-wĕl':* ailing; indisposed.

UNWEPT, a. *ŭn-wĕpt':* not lamented; not mourned.

UNWHIPPED, a. *ŭn-hwĭpt':* not corrected; not chastised.

UNWHOLESOME, a. *ŭn-hōl'sŭm:* not wholesome; unfavorable to health; injurious; corrupt; tainted. UNWHOLE'SOMENESS, n. state of being injurious to health.

UNWIELDY, a. *ŭn-wēld'ĭ:* moved with difficulty; bulky; ponderous. UNWIELD'ILY, ad. heavily; with difficulty. UNWIELD'INESS, n. difficulty of being moved.

UNWILLED, a. *ŭn-wĭld':* not produced by the will; involuntary. UNWILL'ING, a. averse; reluctant; in *OE.,* unintentional; unwilled. UNWILL'INGLY, ad. UNWILL'INGNESS, n. disinclination; reluctance.

UNWIND, v. *ŭn-wīnd':* to loose or separate what has been twisted or convolved; to untwist. UNWIND'ING, a. not turning round; not encircling. UNWOUND', pp.

UNWIPED, a. *ŭn-wīpt':* not wiped; not cleaned by rubbing.

UNWISE, a. *ŭn-wīz':* not wise; lacking or not characterized by wisdom; not discreet and judicious. UNWIS'DOM, n. want of wisdom or discretion; foolishness; imprudence.

UNWISH, v. *ŭn-wĭsh':* to undo by wishing; to wish that the thing which is should not be. UNWISHED, a. *ŭn-wĭsht':* not sought; not desired.

UNWIST, a. *ŭn-wĭst':* unthought of; not known.

UNWIT, v. *ŭn-wĭt':* to deprive of understanding. UNWIT'TING, imp.: ADJ. ignorant; unaware; unconscious. UNWIT'TINGLY, ad. without knowledge or consciousness; ignorantly.

UNWITHERED, a. *ŭn-wĭth'ĕrd:* not withered or faded. UNWITH'ERING, a. not liable to wither.

UNWITNESSED, a. *ŭn-wĭt'nĕst:* not witnessed; not observed or seen by witnesses; not attested by witnesses; wanting testimony.

UNWITTY, a. *ŭn-wĭt'tĭ:* destitute of wit. UNWIT'TILY, ad.

UNWOMANLY, a. *ŭn-wŭm'ăn-lĭ:* unbecoming a woman.

UNWONTED, a. *ŭn-wŭnt'ĕd:* unaccustomed; not made familiar by practice; unusual; uncommon. UNWONT'EDLY, ad. UNWONT'EDNESS, n. uncommonness; rareness. UNWONT', a. OE. for UNWONTED.

UNWOODED, a. *ŭn-wŭd'ĕd:* destitute of trees.

UNWOOED, a. *ŭn-wōd':* not wooed or courted.

UNWORKMANLIKE, a. *ŭn-wĕrk'măn-lĭk:* unlike or unbecoming a workman; unskilful.

UNWORLDLY, a. *ŭn-wĕrld'lĭ:* not worldly. UNWORLD'LINESS, n. the state of being unworldly.

UNWORN, a. *ŭn-wōrn':* not worn or impaired.

UNWORSHIPPED, a. *ŭn-wĕr'shĭpt:* not worshipped or adored.

UNWORTHY, a. *ŭn-wĕr'thĭ:* not worthy or deserving; destitute of merit; unbecoming; base; unmerited. UNWOR'THILY, ad. not worthily; without due regard to merit. UNWOR'THINESS, n. the state of being unworthy; want of merit.

UNWOUNDED, a. *ŭn-wŏnd'ĕd:* not wounded; not hurt; not injured.

UNWOVEN, a. *ŭn-wō'vn:* not woven.

UNWRAP, v. *ŭn-răp':* to open what is folded; unfold; undo the wrappings of.

UNWREATHE, v. *ŭn-rēth':* to untwist; to untwine.

UNWRENCHED, a. *ŭn-rĕnsht':* not wrenched; not strained or distorted.

UNWRINKLED, a. *ŭn-rĭng'kld:* not wrinkled; not shrunk into furrows and ridges.

UNWRITTEN, a. *ŭn-rĭt'tn:* not reduced to writing; verbal; blank. UNWRITTEN LAW, the common law, or that law which has been established by usage—as opposed to the 'written' or 'statute law;' law which is based on custom or judicial decisions.

UNWROUGHT, a. *ŭn-rawt':* not wrought; not labored; not manufactured.

UNWRUNG, a. *ŭn-rŭng':* not pinched.

UNYIELDED, a. *ŭn-yēld'ĕd:* not yielded; not allowed; not given up; not conceded. UNYIELD'ING, a. unbending; unpliant; stiff; obstinate. UNYIELD'INGLY, ad.

UNYOKE, v. *ŭn-yōk':* to loose from or free from a yoke; in *OE.*, to disjoin. UNYOK'ING, imp. UNYOKED', pp.: ADJ. freed from the yoke; not having worn the yoke; in *OE.*, unrestrained.

UNZEALOUS, a. *ŭn-zĕl'ŭs:* not zealous or enthusiastic.

UP, ad. *ŭp* [AS. *up, upp,* up: Dan. and Dut. *op;* Icel. and Sw. *upp;* Goth. *iup;* Ger. *auf,* up, over, on, upon]: in, toward, or to a high or more elevated place or position; aloft; on high; above the horizon; in a state of advance; in, to, or at a state or point of equal advance, as to catch *up* in a race, to keep *up* with the times; in progress, as, what's *up* now?; in a state of being raised or increased; in a state of climbing or ascending; in a state of insurrection; in a state of elevation; in a state of excitement; out of bed; into order, as, he drew *up* his company; from youth to age; at an end, as, it is all *up* with him now: *up* is much used in modifying the action of a verb: PREP. from a lower to a higher position on, as to climb *up* a tree; to or toward the source, head, or important part of, as to sail *up*-stream: INT. or IMPERA. arise; rouse up. UP AND DOWN, in a vertical position or direction; upright; backward and forward; from one place to another; here and there. UP-BY, in *Scot.*, up to or at a place not far off. UP LINE, a line of railway leading to any principal terminus. UP TO, to an equal height or degree; fully prepared for. UP TO THE MARK, UP TO THE KNOCKER, in *slang*, gratifying; satisfactory; excellent. UP TO SNUFF, in *slang*, fully aware of the scent; alive to one's own interest; wide-awake. UP TO TRAP (see under TRAP 1). UP-STREAM, from the mouth toward its head; against the current; opposed to *down-stream*, with the current. UP-TRAIN (see under TRAIN). UP THE COUNTRY, in a direction from the coast, or up a river. THE UPS AND DOWNS OF LIFE, the various changes of good and bad fortune, or the joys and sorrows of life. UP WITH, denoting the act of erecting, or raising to give a blow. ALL UP WITH, all over with. THE TIME IS UP, the allotted time is past. TO BLOW UP, to inflate; to destroy by mining or from below; to reprove sharply. TO COME UP WITH, to reach in following. TO GROW UP, to come to maturity. DONE UP, put in order; dressed for use; exhausted.

UPANISHAD, *û-păn'ĭ-shăd,* mod. Hind. *û-pŭn'ĭ-shŭd:* one of a series of speculative treatises belonging to the Vedic literature which contain the mystical doctrine of the Hindus on the nature of a supreme being, its relation to the human soul, and the process of creation (see INDIA—*Religion*). The word (which is Sanskrit) is made up of *upa,* 'beneath,' or 'near,' and *ni,* 'in,' combined with the radical *sad,* 'sit,' and is explained by the great theologian *S'ankara* (q.v.), and others, as meaning the 'science of Brahman,' or 'the understanding of the identity of Brahman and the soul,' because 'in those devoted to it this science *sets to rest* (or destroys) the world, together with (ignorance) its cause;' or, in other words, because it shows to them that the world has, besides Brahman, no reality. Its etymology has had various explanations, among which that by the grammarian Pân'ini seems most probable—that its earliest sense was that of 'secret' or 'mystery' (literally, 'that which *sits* or rests *beneath*'). In this view these works derived their name from their mysterious doctrine and their mystical style.

The Upanishads are considered to have for their object

the more clear discussion of the questions whose treatment had been begun in the Brâhman'a portion of the old Vedic hymns—questions as to the origin of the world and the true nature of the gods: see INDIA—*Religion*. Their object, like that of the Aran'yakas—whose obscure meaning they seek to make more clear—is to impress the mind with the belief in one supreme spirit (*Brahman*, as a neuter, and different, therefore, from the same word as a masculine, which is the name of the first god of the *Trimûrti*, q.v.); to show that this supreme spirit is the creator of the world; that the world has no reality if thought of besides Brahman; and that the human soul is identical in nature with that same spirit whence it emanates. The reward the Upanishads hold out to the believer in their doctrine is freedom from Transmigration (q.v.), and consequent eternal bliss. Thus the older Upanishads are the forerunners of the philosophical systems—whose aim also is theirs (see SANSKRIT LITERATURE). Ranging over different periods of Hindu religion, they differ from one another in manner and detail. Thus, in some, probably the earliest, legend and ritual blend with theosophical speculation; others are more philosophical; in others, the process of creation is treated in some harmony with the Vedânta (q.v.) or the Sânkhya (q.v.) philosophy; some emphasize the knowledge of Brahman as the only way to eternal bliss; while others, on the contrary, in conformity with the Yoga (q.v.) doctrine, assign a prominent place to the exterior means for union with the supreme spirit. The sectarian Upanishads, which identify this spirit with Vishn'u and S'iva, besides tending to reconcile the popular with the philosophical creed, have probably no claim to rank among Vedic writings.

Of the older Upanishads, a typical instance is furnished in the Chhândogya Upanishad of the Sâmaveda, the framework of which is legendary throughout, and its contents allegorical and mystical. In one of them, an allegorical passage remarkably coincides with the allegory in Plato's *Phædrus*. The *Talavakâra* or *Kena* Upanishad—one of the shortest and most philosophical—sets forth more clearly perhaps than any other, the doctrine that the true knowledge of the supreme spirit consists in the consciousness which man acquires of his *incapacity* to understand it, since the human mind cannot have a knowledge of what is infinite.

The Upanishads, though not supposed to have been revealed in the same manner as the Vedic hymns (see VEDA), are not assigned to human authorship, but deemed inspired writings (see S'RUTI). Some of them declare themselves direct revelations from the self-existent Brahma. As in the case of most ancient Sanskrit works, their date is utterly conjectural.—See Max Müller's *History of Ancient Sanskrit Literature* (Lond. 1860); John Muir's *Original Sanskrit Texts*, I.-IV. (Lond. 1858-63); ed. and transl. of several Upanishads by E. Roer, *Râjendra Lâla Mitra*, and E. B. Cowell, in *Bibliotheca Indica;* also Rajah Rammohun Roy's *Translation of several Principal Books*,

Passages, and Texts of the Veds (Lond. 1832). The names of 149 Upanishads were compiled by M. Müller: see his translation of the Upanishads.

UPAPURÂN'A: see PURÂN'A.

UPAS, n. *ū'pas* [Javanese]: poison: specifically, a poison consisting of the milky juice of the *Antiaris toxicaria*, or Upas-tree (q.v.), used by the Malays to poison their arrows, mixed with black pepper and the juice of the galanga-root and ginger; also, the tree from which this poison is derived. The prepared upas or antjar poison is kept in closed tubes of bamboo, and is of the consistence of molasses. The flesh of animals killed by this poison may be eaten with safety; though the virulence of the poison is shown by its extremely rapid action. It is not known what the substance is which gives to the juice of the upas-tree its poisonous properties, but it appears to be an alkaloid.—A still more powerful poison than the upas antjar is the *Upas Tjettek*, or *Upas Tieute*, prepared from the root of the *Strychnos Tieute* (see STRYCHNOS): it abounds in strychnine.

UPAS-TREE, n. *ū'pas-trē* [from Javanese *upas*, poison, and English *tree*: in Malay, *puhn-upas*, the poison tree—from *puhn*, tree: and *upas*, poison]: tree common in the forests of Java and adjoining islands; the *Antĭāris toxicāria*. It attains a height of upward of 100 ft., and belongs to the nat. order ARTOCARPACEÆ (q.v.), the order to

Antjar (*Antiaris toxicaria*).

which the bread-fruit belongs. The leaves are lanceolate; the female flowers solitary, the male flowers congregated beneath them on the receptacle, which has a long stalk, and is of the shape of a watch-glass. The fruit is a kind of drupe, covered with fleshy scales. Though the fresh juice of this tree, when brought into contact with the skin,

acts as a poison, the story of a poison-vale in Java, in which the exhalations of numerous poison-trees extinguish all animal life, and even all other vegetable life, is a mere fable. There is a narrow valley in Java where neither animal nor vegetable life can subsist; but this is owing to carbonic acid gas emitted from the ground, as in the *Grotto del Cane*, near Naples; and the upas-tree is as incapable of living there as any other. The upas-tree is found in forests, and does no harm to the other trees around it. The fibre of the bark of the upas-tree is sometimes made into cloth; but unless the fibre is thoroughly cleaned, garments made of it produce a painful itching.

UPBEAR, v. *ŭp-bâr':* to bear up; to raise aloft; to elevate; to support; to sustain aloft.

UPBLOW, v. *ŭp-blō':* to blow up or puff out; to make tumid.

UPBRAID, v. *ŭp-brād'* [from *up*, and the root of *bray*, to bawl, yell: Prov. *braidir*, *braidar*, to cry: Port. *bradar*, to cry out, to yell]: to charge with something wrong or disgraceful; to reprove with severity; to chide; to reproach; to cast in the teeth: N. in *OE*, reproach; reproof. UPBRAID'ING, imp.: N. the act of reproaching in severe terms; reproaches or accusations made against any one to his face. UPBRAID'ED, pp. UPBRAID'INGLY, ad. *-lĭ.*—SYN. of 'upbraid, v.': to censure; condemn; reproach; blame; reprove.

UPBRINGING, n. *ŭp'brĭng-ĭng:* rearing; training; education.

UPCAST, a. *ŭp'kăst:* cast up; thrown upward; directed upward, as the eyes: N. in *bowling*, a throw. UPCAST, or UPCAST-SHAFT, in *mining*, the shaft for carrying off foul or heated air.

UPCOILED, a. *ŭp-koyld':* made into a coil.

UPDRAW, v. *ŭp-draw':* to draw up.

UPGATHER, v. *ŭp-găth'ér:* to draw together close; to contract.

UPGAZE, v. *ŭp-gāz':* to look upward.

UPGROW, v. *ŭp-grō':* to grow up or over. UP'GROWTH, n. *ŭp'grōth*, increase; growth; advancement.

UPHAM, *ŭp'am*, CHARLES WENTWORTH: author: 1802, May 4—1875, June 14; b. St. John, N. B. He was for a while apprentice to an apothecary in St. John, then went to Boston, entered Harvard, there graduated, and, after studying theology in the Divinity School, was pastor of the First Chh. (Unit.) at Salem, Mass., 1824–44, retiring then on account of a bronchial affection. He was mayor of Salem 1852; member of the Mass. legislature 1840, 1849, and 1859–60. He served in the Mass. constitutional convention 1853, and in congress 1853–55. He was editor of the *Christian Register* 1845–6, and contributed to magazines and reviews. He was author of *Letters on the Logos; Lectures on Witchcraft; Life of Sir Henry Vane; Prophecy; Memoir of Francis Peabody;* and of the last 3 vols. of the *Life of Timothy Pickering.*

UP'HAM, THOMAS COGSWELL, D.D., LL.D.: metaphysician: 1799, Jan. 30—1872, Apr. 2; b. Deerfield, N. H. He graduated at Dartmouth 1818, and at Andover Theol. Sem. 1821; was asst. prof. of Hebrew at Dartmouth 1821–2; pastor of a Congl. chh. in Rochester, N. H., 1823; prof. of mental and moral philosophy at Bowdoin 1824–67. He was author of many works on philosophy and on religious devotional life and experience; and translated several works of a similar character, as Jahn's *Biblical Archæology; Life*, etc., *of Mme. Guyon.* Among his own writings are: *Elements of Intellectual Philosophy; Treatise on the Will; Imperfect and Disordered Mental Action; Life of Faith; Treatise on Divine Union; Method of Prayer; Christ in the Soul.*

UPHEAVE, v. *ŭp-hēv':* to lift up from beneath; to rise or swell upward. UPHEAV'ING, imp. UPHEAVED', pp.: ADJ. lifted or forced up from below by some elevating power. UPHEAV'AL, n. a lifting up from below; in *geol.*, a lifting up of strata by some expansive or elevating power from below; a change in stratified rocks from an original horizontal position to one more or less inclined, produced by an expansive subterranean force, or other power, like the pushing forward of the crust itself, as in the case of the Appalachian Mountains (q.v.). In slight changes of level the continuity of the rock is unbroken; but frequently immense cracks are formed, into which igneous rocks penetrate, and form a backbone for the upraised mass, or dikes penetrating the strata. Upheavals may take place slowly, like the present gradual change in the Scandinavian coast, or may be more rapid when produced by some sudden earthquake. Sometimes the folding of the crust is such that rocks of an earlier age are superimposed on others of a later. See SYNCLINORIUM.

UPHELD, *ŭp-hĕld':* pt. and pp. of UPHOLD (q.v.).

UPHILL, a. *ŭp'hĭl:* steep, as a road; difficult or tedious, like the act of ascending a hill.

UPHOARD, v. *ŭp-hōrd':* to hoard up; to store away in a secret place; to store up; to treasure.

UPHOLD, v. *ŭp-hōld':* to lift on high; to elevate; to support or keep from falling; to maintain; to support; to sustain; to continue; to continue without failing; to keep from being lost. UPHOLD'ING, imp. UPHELD', pt. and pp. sustained; kept from falling. UPHOLD'ER, n. one who upholds; a defender; in *OE.*, an undertaker; an upholsterer.

UPHOLSTERER, n. *ŭp-hōl'stĕr-ĕr* [a corruption of *up holdster* or *upholder*, the original meaning being, one who furbishes up old goods]: one who furnishes houses with beds, curtains, and the like; one who covers and cushions sofas, chairs, etc. UPHOL'STERY, n. *-ĭ*, the trade of an upholsterer; that kind of house-furnishings supplied by an upholsterer; upholsterer's work. UPHOL'STER, v. *-stĕr*, to supply with house-furnishings; to provide with cushions, springs, coverings, etc., as to *upholster* chairs, sofas, etc. UPHOL'STERED, a. *-stĕrd*, fitted with hangings and coverings of cloth, etc.

UPJOHN, *ŭp'jŏn*, RICHARD: architect: 1802, Jan. 22—1853, Aug. 16; b. Shaftesbury, England. He learned the trade of carpenter and cabinet-maker in England; settled in New Bedford, Mass., 1829, and removed to Boston 1833. He designed the entrances to Boston Common, and designed and built St. John's Chh., Bangor, Me.; and other churches. Called to New York 1839, he designed Trinity Chh. there, and thereafter built several churches in that city and Brooklyn. He was the architect also of the Trinity Building and Corn Exchange Bank, and executed designs for many private residences throughout the country.

UPLANDS, n. *ŭp'lăndz* [*up*, high, and *lands*]: ground elevated at intervals above the meadows and flats which lie on the banks of rivers, near the sea, or between hills; high ground. UP'LAND, a. pertaining to uplands; higher in situation. UP'LANDER, n. *-ĕr*, one who resides on the uplands. UP'LANDISH, a. *-ĭsh*, in *OE.*, dwelling on the higher grounds or on mountains; rustic; clownish.

UPLEAD, v. *ŭp-lēd'*: to lead upward. UPLED', pp. in *OE.*, led upward.

UPLIFT, v. *ŭp-lĭft'*: to raise; to elevate; in *Scot.*, to take up before due, as wages: N. a heaving or lifting up. UPLIFT'ING, imp. UPLIFT'ED, pp.: ADJ. raised high; elevated.

UPLOCK, v. *ŭp-lŏk'*: in *OE.*, to lock up.

UPMOST, a. *ŭp'mōst* [*up*, high, and *most*]: highest; topmost. UPPERMOST is now generally used for UPMOST.

UPOLU, *ô-pō-lō'*: largest but one of the Samoan group of islands in the Pacific (see SAMOA); about 60 m. w. of Tutuila (q.v.), the third island in size; 550 sq. m. U. is mountainous, but well wooded and fertile, and has several rivers. The chief harbor is Apia (q.v.), a civilized-looking place, with many edifices on the European model. Many of the natives are giving attention to cultivation of cotton, and the cotton-seed grows wherever it is cast on the ground. Coffee also is cultivated. The principal article of export is cocoa-nut oil. U. affords a plentiful supply of fruits and vegetables, and is visited annually by Brit. and Amer. whalers. The island became a possession of Germany in 1899. Many of the native inhabitants are Christians.—Pop. (1900) 18,341 (including 300 Europeans and Americans).

UPON, prep., sometimes used as an ad., *ŭp-ŏn'* [AS. *uppon*, *uppan*, upon—from *up*, *upp*, up; *on*, *an*, on]: resting on the top or surface of; not under: *upon* is in most uses strictly synonymous with *on*, whether denoting situation, as, *upon* the table; assumption, as, he took an office *upon* him; time when, as, *upon* the third day; basis or security, as, to lend money *upon* land; subsistence, as, to come *upon* the parish; engagement, as, to start *upon* an enterprise, etc.

UPPER, a. *ŭp'pĕr* [comparative of *up*]: higher in place, rank, or dignity. UP'PERS, n. plu. the upper leather of a boot or shoe. UP'PERMOST, a. superl. *-mōst*, highest in place, rank, or power; predominant; most powerful. UPPER-HAND, n. superiority; advantage. UPPER HOUSE, the higher of two houses, in bicameral legislation; in Great Britain, the house of peers. UPPER SERVANT, one of the higher servants where many are kept. THE UPPER STORY, the head. UPPER TEN THOUSAND, UPPER TEN, the highest classes of the community; the aristocracy. UPPER WORKS, in a *ship*, the parts above water when the ship is fully freighted for a voyage. UP'PISH, a. *familiarly*, proud; stuck-up. UP'PISHNESS, n. empty pride; arrogance.

UPRAISE, v. *ŭp-rāz':* to exalt; to raise up.

UPRIGHT, a. *ŭp'rīt* [*up*, high, and *right*]: erect; possessing rectitude; honest: N. something standing erect and perpendicular; a timber supporting a rafter or beam. UPRIGHT'LY, ad. in an upright manner; perpendicularly; honestly. UPRIGHT'NESS, n. state of possessing honesty and integrity. UPRIGHT'EOUSLY, ad. in *OE.*, uprightly.

UPRISE, v. *ŭp-rīz':* in *poetry*, to get up from a recumbent position; to rise from below the horizon; to rise, as a hilly ascent: N. in *OE.*, appearance above the horizon. UPRISING, n. *ŭp-rī'zĭng*, the act of rising from below the horizon, as the sun; the act of rising from a recumbent or sitting posture; a rebellion.

UPROAR, n. *ŭp'rōr* [Dut. *oproer*, a tumult, a sedition—from *op*, up; *roeren*, to stir: Dan. *röre;* Ger. *rühren;* AS. *hreran;* Icel. *hræra*, to move, to agitate: Ger. *aufruhr*, disturbance]: a violent disturbance and noise; bustle and clamor: V. in *OE.*, to disturb by tumult or violence. UPROAR'IOUS, a. *-ĭ-ŭs*, accompanied with great noise and disturbance. UPROAR'IOUSLY, ad. UPROAR'IOUSNESS, n. *-nĕs*, tumultuousness.

UPROLL, v. *ŭp-rōl':* to roll up.

UPROOT, v. *ŭp-rōt'* [*up*, high, and *root*]: to tear up by the roots; to destroy utterly; eradicate. UPROOT'ED, pp.

UPROUSE, v. *ŭp-rowz':* to awaken from sleep; to excite to action.

UPRUSH, v. *ŭp-rŭsh':* to rush or sweep upward.

UPSALA, *ŭp-sâ'lâ:* city of Sweden, on the Fyrisä, a navigable stream, 42 m. n.n.w. of Stockholm. The e. part stands on a wide and fertile plain; the w. part, containing the chief buildings, on high ground overlooking an apparently boundless plain to the n. and e. U. is the seat of an abp., the primate of Sweden. The great attraction is the cathedral, formerly a beautiful structure, of brick, in Gothic style, founded 1258, completed 1435; it is 330 ft. long by 140 wide, and 105 in height. It contains the tombs of Linnæus (q.v.), and of Gustavus Vasa and other Swedish kings. The Univ. of U.—chief institution of the kind in Sweden—founded 1477, has about 1,900 students, 30 professors, and 61 teachers. The library contains 250,000 vols. and 11,000 MSS., several of which

are very valuable. The castle, where the residence of the governor is, was founded middle of 16th c. by Gustavus I., but not finished until a century later.—Pop. (1901) 23,802, including the students; (1901) 25,236.

Two m. n. of the town is Old Upsala, now a village, which during the heathen period was the seat of the Odin worship, with a splendid temple and sacred grove, which have now disappeared. Also, about 4 m. from U. are the famous Mora-stones, where in the middle ages the election and crowning of the Swedish kings took place.

UP-SAR-O'-CA, or ABSARO'KA (Indians): see CROWS.

UPSET, v. *ŭp-sĕt':* to overturn; to overset; to throw down from an erect position; to disturb; unsettle, as, the news *upset* me; in *OE.*, to set or place up. UP'SET, n. an overturn; the act of disturbing or unsettling: ADJ. settled; fixed. UPSET PRICE, the price stated beforehand as the starting price below which bids will not be received when a house, estate, ship, or the like is put up for sale by auction—the sum from which increased offers may begin.

UPSHOT, n. *ŭp'shŏt:* conclusion; end; final issue; outcome; result.

UPSIDE, n. *ŭp'sīd:* the upper side or part. UP'SIDES, ad. *-sīdz*, in *familiar language*, in the phrase 'I shall be *upsides* with him,' meaning I shall get even with him; I shall have my revenge. UPSIDE-DOWN, ad. *ŭp'sīd-down'* [OE. *up-so-down*]: with the upper part down; in complete disorder and confusion; upsodown; topsy-turvy.

UPSPRING, v.: in *OE.*, to spring up: N. in *OE.*, a man suddenly raised; an upstart.

UP-STAIRS: see under STAIR.

UPSTART, n. *ŭp'stârt:* one who has suddenly risen from a humble station to wealth and power, and uses them arrogantly: V. to spring up suddenly: ADJ. suddenly raised to wealth and power.

UPSTAY, v. *ŭp-stā':* in *OE.*, to sustain; to support.

UPSWARM, v. *ŭp-swawrm':* to rise in a swarm or swarms.

UPTAKE, v. *ŭp-tāk':* in *OE.*, to take into the hands: N. *ŭp'tāk*, in *Scot.*, power or capacity to learn; understanding; comprehension.

UPTEAR, v. *ŭp-tär':* to tear up; to rend.

UPTHROW, n. *ŭp'thrō:* in *mining*, a sudden uplift of strata by a fault or dislocation; upheaval.

UPTON, *ŭp'ton*, EMORY: soldier: 1839, Aug. 27—1881, Mar. 14; b. Batavia, N. Y. On graduating at West Point, 1861, he became 2d lieut. of artillery, and the same year 1st lieut. He was wounded at the first Bull Run battle; commanded a battery in the Va. Peninsular campaign and in the Md. campaign 1862; in Oct. became col. of a N. Y. vol. regt., and commanded a brigade in the 6th corps of the Potomac Army till the end of 1863. For conspicuous bravery he was promoted brig.gen. of vols. on the field 1864, May 12. He served in the siege of

Petersburg and in the defense of Washington 1864; was severely wounded while commanding an infantry division in the Shenandoah campaign; and commanded a cavalry division during the closing operations in Ga. and Ala. He was brevetted maj.gen. U. S. A. at the end of the war; became lieut.col. 25th infantry U. S. A. 1866; was commandant of cadets at West Point 1870–75; col. 4th artillery 1880. He wrote volumes on *Tactics* and on *The Armies of Asia and Europe:* see his *Life and Letters,* by Peter S. Michie (1885).

UPTRAIN, v. *ŭp-trān':* to train up; to educate

UPTURN, v. *ŭp-tėrn':* to turn up.

UPWARD, a. *ŭp'wėrd* [AS. *up,* up; *weard* or *weardes,* used in composition to express direction]: directed to a higher place; having an ascending direction: AD. toward a higher place; toward the head or source; also UP'WARDS, *-wėrdz,* opposed to *downwards.*

UPWHIRL, v. *ŭp-hwėrl':* in *OE.,* to raise upward with quick rotation.

UPWIND, v. *ŭp-wīnd':* to wind or roll up; to convolve. UPWOUND', pp.

URACHUS, n. *ū'rā-kŭs* [Gr. *ourachos,* the urinary canal of a fetus—from *ouron,* urine]: a cord composed mainly of fibrous tissue, but containing some smooth muscle and sometimes the remains of an epithelial-lined cavity, attached to the summit of the bladder and ascending to the umbilicus. It represents part of the allantois, a sac of the embryo, from which the bladder develops as a dilatation of the internal portion, while the original cavity disappears.

URÆMIA, n. *ū-rē'mĭ-ā* [Gr. *ouron,* urine; *haima,* blood]: in *med.,* poisoning of the blood in some disorders of the urinary organs. URÆ'MIC, a. *-mĭk,* of or pert. to uræmia.

URAL, *ū'ral* or *ô-râl'* (formerly JAIK or YAIK, the *Rimna* of the ancients): name since 1775 of a river of Russia, rising in the s. section of the Ural Mts., near the e. frontier of the govt. of Orenburg, and flowing s. through the dist. of Troizk, past the town of Virchni-Uralsk, to its confluence with the Kisil: in this region its current is very rapid, due to its narrow and uneven bed. At the town of Orsk the U. bends and runs w. as far as the mouth of the river Tchagan; after which it flows directly s. into the Caspian Sea. It is in parts deep enough for navigation; but the scarcity of wood for ship-building, and the number of sand-banks that bar the river, prevent navigation. It abounds in highly esteemed varieties of fish, and yields to the Cossacks settled along its banks an annual revenue of 600,000 roubles (about $450,000). The U. has long served as the boundary between Russia and the Kirghis Steppes, and many forts have been erected, and settlements of Cossacks—known as the U. Cossacks—established along the river. The direct length of the U. is estimated at 550 m.; with its windings, 1,040 m. The principal affluents are the Kisil and Sakmara on the right, and the Or and Ilek on the left.

URAL-ALTAIC: see TURANIAN.

URALITE, n. *ū'rā-līt* [from the *Ural* Mountains, where first found]: a pseudomorphous mineral of a dark-green or greenish-black color.

U'RAL MOUNTAINS (the *Hyperborean Mountains*, or *Rhipæi Montes*, of the ancients): chain of mountains, forming the boundary between Europe and Asia, separating European Russia on the w. from Siberia on the e. The U. M. extend s. from the Kara Sea, arm of the Arctic Ocean, to the middle course of the Ural river—i.e., lat. 70°—50° n.; 1,333 m. in length, with breadth varying from 16 to 66 m. Though the U. M form a single uninterupted chain, they are usually divided by geographers into the N., Middle, and S. Ural. The N. Ural separates the basins of the rivers Petchora and Ob, is mostly rocky, seldom rises higher than 3,600 ft., and is commonly called *Poustoi* (empty), because it is extremely poor in mineral wealth. The Middle Ural, commonly called *Roudnoi* (metalliferous), principal seat of the mineral riches of the chain, comprises the highest peaks, as the Kanjakovski Kamen, 5,000 ft.; but in some places the height is so insignificant, and the slope so gentle, that travellers can scarcely distinguish it from the lowlands. The Southern U. divides into 3 branches, 2 of which extend e. of the Ural river, and gradually disappear in the Uralo-Caspian deserts; while the third branch extends along the w. bank of the Ural. The chain is composed chiefly of crystalline and metamorphic rocks, granite, gneiss, porphyry, chloritic, and micaceous schists. The U. M., especially the middle and the n. of the S. Ural (the govts. of Perm and Orenburg), abound in mines of gold, platinum, copper, and iron. These mines, or *zavods*, belong partly to the state and partly to individuals. Of the latter, the chief are the Nijni-Tagilsk, belonging to the Demidoff family (a grant from Peter the Great); the Verchisetsk and Neviansk, belonging to the Takosleff family. The gold diggings are on both slopes of the mountains: sometimes nuggets of considerable weight are found—the heaviest ever found in the chain being about 80 lbs. During about half a century the annual value of the product of the Ural mines has increased from 50 millions of roubles to about 80 millions. From 1870 to 1880 the gold production reached 9,600 lbs. per annum, and that of platinum about 3,400 lbs. From 1880–84 it was 6,949 lbs. More than four-fifths of the iron of Russia is got from the Ural districts: in 1884 the output was, of pig-iron 337,000 tons, of iron 193,700 tons, and of steel 38,167. The magnetic ironstone of the Urals is admirably suited for making steel and wire, and is largely exported for this purpose. Several thousand tons of copper are raised annually, besides immense quantities of rock-salt—1884, 471,000 tons. Among precious stones, most notable is the emerald, found on the e. slope in the dist. of Ekaterinburg; some of these have weighed more than 13 dwts. Other precious stones are the beryl, topaz, amethyst, and perhaps the diamond, for, though found in a certain locality, as

predicted by Humboldt, it is now generally believed that the locality was 'salted.' Malachite and jasper also occur. In 1884 a pop. of 183,914 was supported by the mining and metallurgical operations in the Ural Mountains.

URALSK, *ô-râlsk'*: province of s.e. Russia; 141,174 sq. m.; n. of Caspian Sea, and for the most part e. of the Ural river—i.e., in Asia. Most of U. is below sea-level. It is dotted with salt lakes.—Pop. (1883), 525,330; of whom 405,000 are nomadic Kirghis, 15,000 Russians, and the rest Ural Cossacks; (1889) 559,552; (1897) 644,001.

URALSK, *ô-râlsk'*: Russian town, cap. of prov. of U.; on the right bank of the Ural, 150 m. s.s e. of Samara, 1,095 m. from Moscow. It was founded 1622 by the Ural Cossacks, and was till 1775 known as Jaitsk. A good trade is carried on—the principal articles being fish, isinglass, caviare, tallow, and cattle. There are three great yearly fairs—in July, Oct., and Jan.—Pop. (1897) 36,597.

URANIA, n. *ū-rā'nĭ-ā* [L. *uranĭa;* Gr. *ouranĭa*, the heavenly—from Gr. *ou'rănos*, heaven]: in *anc. myth.*, daughter of Zeus and Mnemosyne, the Muse of Astronomy (see MUSES, THE); one of the minor planets; a genus of plants with one species, found in Madagascar, and characterized by the enormous size of its leaves. URANITE, n. *ū'ră-nīt*, a mineral, consisting of phosphate of uranium with oxide of copper or lime, of a bright yellow or green color—differs from *mica* in being neither flexible nor elastic. URANIUM, n. *ū-rā'nĭ-ŭm*, an elementary body, a metal obtained from several minerals in the form of a powdery substance of a grayish-black color with a metallic lustre, preparations of which are used for imparting fine orange tints to glass and porcelain enamel. URANIC, a. *ū-răn'ĭk*, of or pertaining to uranium. U'RAN, or URANIUM OCHRE, the earthy oxide of uranium, found in soft friable masses, having various hues of yellow and orange.

URA'NIUM (symb. U, at. wt. 239, sp. gr. 18·7): very hard but moderately malleable metal, resembling nickel or iron in lustre and color; but in a finely comminuted state occurring as a black powder. It is not oxidized by exposure to air or water at ordinary temperatures; but if heated in the air, it burns brilliantly, and is converted into oxide. It is comparativly rare, never occurring native—its sources being *Pitchblende*, which contains nearly 80 per cent. of black oxide; *Uranite*, which contains a hydrated double phosphate of lime and uranium; and *Chalcolite*, which is a similar phosphate of copper and uranium. U. forms the following oxides: *Uranous oxide*, UO_2, obtained by heating uranoso-uranic oxide, U_3O_8, in a current of hydrogen; it is a brown powder, and when dissolved in acids forms green salts: *Uranoso-uranic oxide*, U_3O_8 ($=UO_2 2UO_3$), the chief constituent of pitchblende, is obtained artificially by igniting uranous oxide (or the metal) in contact with air; it is a dark-green velvety powder; ignited alone, it forms a black oxide, U_2O_5. *Uranic oxide*, or *Uranyl oxide*, UO_3, is obtained by dissolving the metal or its lower

oxides in nitric acid, and heating in a glass tube the resulting uranic nitrate till it begins to decompose at 482° F.: uranic oxide remains as yellow powder. Uranic oxide and its hydrates (monohydrate, $UO_3.H_2O$; uranyl dihydroxide, $UO_2(OH)_2$) dissolve in acids, forming uranic salts. The black oxide is employed in coloring porcelain. *Sodium uranate,* $Na_2O(UO_3)_2$, is used to give greenish or yellowish color to glass, and as yellow pigment in glazing porcelain. All U. compounds, when fused with phosphorus salt or borax in the outer blow-pipe flames, produce a clear yellow glass, which becomes greenish on cooling.—U. ores exist in the Dakotan Black Hills under the forms *Uranite,* found on analysis to have the chemical constitution $U_2O_2.2PO_4.Cu$; *Pitchblende* of the composition U_3O_4, with iron, lead, magnesium, manganese, silica; *U. ochre,* $U_2O_3.3SO_3$; *Trogerite,* $3UO_3.As_2O_5$. Till the discovery of these minerals in the Bald Mountain of the Black Hills, all the U. of commerce came from Annaberg in Saxony, and Redruth in Cornwall, England.

URANOGRAPHY, n. *ū-rā-nŏg'ra-fĭ* [prefix *urano-;* Gr. *graphō,* I write, I describe]: description or chart of the heavens; that branch of astronomy comprising the determination of the relative situations of the heavenly bodies and the construction of celestial maps, globes, etc.

URANUS, n. *ū'ra-nŭs* [mod. L.—from Gr. *ouranos,* heaven; specifically, the celestial vault]: in *Gr. myth.*, the most ancient of the gods. His wife was Terra, or Earth, by whom he had, first, the children called the Hundred-handed, Briareus, Cottus, and Gyges; secondly, the Cyclopes, Arges, Steropes, and Brontes; thirdly, the Titanes, Oceanus, Cœus, Saturnus; and, lastly, the Giants. Uranus hated his children, and confined them in Tartarus; but, at the instigation of his mother, Saturnus (see SATURN), youngest of the Titans, overthrew, dethroned, and mutilated him; and from his blood sprang the Furies, Alecto, Tisiphone, and Megæra.

U'RANUS: planet (named at first *Georgium Sidus* and *Herschel*) whose orbit is between those of Saturn and Neptune; thus next to the outermost known planet in the solar system: see PLANET: SOLAR SYSTEM.

URAO, n. *ū-rā'ō:* a native name for the sesquicarbonate of soda, found in crystalline crusts in the dried-up lakes and river-courses of S. Amer., known to the Arabs of Africa, etc., by the name of *trona.*

URARI, n. *ū-rā'rĭ* or *ū'răr-ĭ:* see CURARE.

URATE: see under URIC.

URBAN, a. *ėr'ban* [L. *urbānus,* belonging to the city—from *urbs,* a city]: of or belonging to a city or town; resembling or characteristic of a city; dwelling in cities or towns; in *OE.*, courteous. URBANE, a. *ėr-bān',* courteous; civil; polite; refined. URBANITY, n. *ėr-băn'ĭ-tĭ,* courtesy; politeness; civility; polished manners; suavity; affability.

URBAN, *ér'ban*, II. (surnamed OTHO or ODO), Pope abt. 1042–99, July 29 (reigned 1088–99); b. at Lagery, near Chatillon-sur-Marne; of knightly rank. He was educated for the priesthood, and was archdeacon of Rheims, when he resigned, and became a monk at Clugny, of which he afterward became prior. In 1078 he was cardinal-bp. of Ostia, and was elected pope 1088, in a council at Terracina, during the schismatical pontificate of the anti-pope, Guibert, styled Clement III. Soon after his election, he resumed possession of Rome, whose fortresses had been occupied by the anti-pope, whom he compelled to withdraw. Guibert, however, was still supported by his patron, Henry IV. of Germany, who had long been at feud with the papal see; and U., with Countess Matilda, having formed a strong party in Italy, Henry once more led an army thither, restored the anti-pope, and forced U. to flee. U. established himself at Anagni. The revolt of Conrad, eldest son of Henry, against his father, and his coronation as emperor at Milan 1093, and still more the successful appeal of Henry's queen, Adelaide, turned the tide of affairs in Italy. A great council was held at Piacenza 1095, in which the anti-pope and his adherents were excommunicated. In the same council the Crusade was proclaimed; and, in the following autumn, U., in a council held at Clermont, made the well-known appeal which called forth that enthusiasm which was destined to lead to the long series of efforts for recovery of the Holy Land, forming so striking a characteristic of mediæval history. In his later pontificate U. pursued the same course, and in the end succeeded in driving Henry IV. out of Italy. The most important event of the last years of his pontificate was the council held at Bari 1098, in which many Greek bishops were present, and in which the addition of the words *Filioque* (q.v.) to the creed was discussed. Thence he returned to Rome, of which he obtained full and undisturbed possession. He died 14 days after the fall of Jerusalem, but before the news reached him.

UR'BAN V. (originally named WILLIAM DE GRIMOARD), Pope: 1309–70, Dec. 19 (reigned 1362–70); b. Grisac, Languedoc, France. He was a Benedictine monk; became abbot of Auxerre 1353, and of St. Victor at Marseille 1358. On the death of Innocent VI, 1362, Oct. 28, U. was elected pope at Avignon, where he continued to reside, sending his legate, Cardinal Gil de Albornoz, to reduce the rebellious subjects of the papal see in Rome. After various alternations of peace and contest, U. resolved to return in person to the ancient seat of the papacy. He set out 1367, and, landing at Corneto, proceeded first to Viterbo, and reached Rome in Oct. He found the papal city in great disorder, and all Italy overrun by bands of mercenaries, and a prey to frightful intestine divisions. Failing in his endeavors to correct these disorders, he resolved 1370 to withdraw from Rome. He arrived at Avignon Sep. 24, where he died three months later, leaving a reputation of great personal piety, disinterestedness, and zeal for the interests of religion. He was succeeded by Gregory XI.

URBAN VI. (original name BARTOLOMMEO PRIGNANO), Pope: 1318–89, Oct. 15 (reigned 1378–89); b. Naples. At the time of his election to the papal see, 1378, Apr. 8, he was abp. of Bari. On the death of Gregory XI., who had finally returned to Rome, and had died in that city, Prignano was elected in a conclave held under circumstances of great excitement, owing to the apprehension, on the part of the populace, of an intention to elect a French pope, and again abandon Rome. The cardinals in the conclave numbered 16, of whom 12 were French and 4 Italians. Prignano, though not a cardinal, was elected unanimously, though the populace broke into the hall. Prignano assumed the title Urban VI., and was crowned Apr. 18, in the presence of the 16 cardinals. In July the 12 French cardinals assembled at Anagni, and revoked the election of U., declaring that in it they had acted under fear of violence. To this course they are said to have been led by the rigor and the intemperate severity with which U. was proceeding in reforms of discipline, especially as regarded the simony and the irregular life of the clergy, including the cardinals themselves. Joined by three of the Italian cardinals (one of them having died), they elected the cardinal-bp. of Cambray (born Count of Geneva) pope, under the name Clement VII., Sep. 20. Clement took up his residence at Avignon. U. remained at Rome, where he appointed 26 new cardinals, and excommunicated Clement and his adherents. This conflict was the origin of the WESTERN SCHISM (q v.). U. was recognized as the lawful pope by one portion of the West, Clement by the other; and each maintained his claim by extreme measures. U. especially, though his title seems to have been best founded, weakened his cause by his excessive violence. Having engaged in a dispute with Charles, King of Naples, whom he himself had crowned, he was besieged by that prince at Novara, whence he withdrew to Genoa, taking with him, as prisoners, the cardinals of his party with whom he had quarrelled, several of whom he is said to have put to death. In 1389, while on his way to Ferentino, he fell from his horse, and having been conveyed to Rome, died there from the injuries thus sustained.

URBAN VIII. (originally named MAFFEO BARBERINI), Pope: 1568–1644, July 29 (reigned 1623–44); b. Florence. After a long series of brilliant services in the domestic administration and in foreign nunciatures, he was elected pope (succeeding Gregory XV.) 1623, Aug. 6. In the difficult position of Roman affairs he acquitted himself with much dexterity. His pontificate was signalized by the acquisition by the holy see of the duchy of Urbino (q.v.) 1626. U. died in Rome. His memory has suffered through the imputation of nepotism; but his administration was, on the whole, vigorous and enlightened. He was the founder of the celebrated College of the Propaganda, and to him Rome is indebted for many public works, including large and important additions to the Vatican Library. Some of the early stages of the Jansenist controversy (see JANSEN) fall within this pontificate.

URBANA, *ėr-băn'a:* city, cap. of Champaign co., O.; on the Erie, the Pittsburgh Cincinnati Chicago and St. Louis, and the Cleveland Cincinnati Chicago and St. Louis railroads; 31 m. w. of Danville, 42 m. w.-by-n. of Columbus. It is in a rich agricultural region; has gas and electric lights, and Holly water-works system; and contains 15 churches, Y. M. C. A. building, court-house, high school (cost $125,000), several grammar schools, public library, Urbana Univ. (New Church), Odd Fellows' Temple, Soldiers' Monument (cost $15,000), 1 national bank (cap. $50,000), 1 private bank, and 1 daily, 1 weekly, and 1 monthly publication. The industries comprise the manufactures of the U. S. Rolling Stock Co. and the Urbana Machine-works, besides those of agricul. implements, carriages and wagons, stoves, brooms, shoes, furn., leather, and woolen goods.—Pop. (1890) 6,510; (1900) 6,808.

URBI ET ORBI, *ėr'bī ĕt or'bī* [L. *literally*, to the city, i.e., Rome, and to the world]: the form used in the publication of papal bulls, to signify their formal promulgation to the entire Cath. world, as well as to the city of Rome. By canon law, promulgation is necessary to give any new law force. A controversy arose in the 17th c. as to the kind of promulgation which should be regarded as sufficient. In ancient times the practice of the popes had been to send copies of their bulls to the primates, metropolitans, and other ecclesiastical heads of the several churches, to be by them communicated to their suffragan bishops; but in course of time the practice of publicly proclaiming the decree by the voice of a crier (*præco*) from the piazza of the Campo di Fiore (*in acie campi Floræ*), or of affixing the document to the gates of the Vatican, was substituted, and decrees addressed URBI ET ORBI, and published in this way, were held to be sufficiently promulgated, and to be thenceforth of full force. French jurists of the 17th c. strenuously opposed this view.

URBINO, *ôr-bē'nō:* city of central Italy, cap. of the prov. of Urbino and Pesaro; 20 m. s.w. of Pesaro, between the rivers Metauro and Foglia. Its walls date from the 14th c.; it has a magnificent palace, formerly the residence of the Dukes of U., where was the famous library of the Della Rovere family, afterward removed to the Vatican. Another handsome palace is that of the Albini, belonging to an Albanian family who had escaped from the ferocity of the Turks, and settled in U., where they became rich and powerful, and gave a pope to the church, who took the name Clement XI. U. is an archiepiscopal see. It is the birthplace of Raphael (q.v.). U. was a *municipium* or free town under the Romans, and during the middle ages became the seat of a race of independent dukes. In 1626, on the death of Francesco, the last duke, Pope Urban VIII. took possession of the duchy as a vacant fief; and it was part of the Papal States till it became part of the kingdom of Italy.—Pop. about 5,000.

URCEOLAR, a. *ĕr'sĕ-ō-lĕr* [L. *urcĕŏlus*, a little pitcher, a water-pot, dim. of *urcĕus*, a pitcher]: in *bot.*, fleshy or bulging, as tubercles or leaves. UR'CEOLATE, a. *-lāt*, urn-shaped; shaped like a pitcher. UR'CEOLUS, n. *-lŭs*, in *bot.*, the two confluent bracts of the genus *Carex;* any anomalous organ shaped like a cup.

URCHIN, n. *ĕr'chĭn* [OE. *urchone*, a hedgehog—from OF. *ireçon*—from L. *erĭcĭus;* Gr. *chēr*, a hedgehog, an urchin: F. *hérisson*, a hedgehog]: the hedgehog; a familiar name given to a child; a little child; in *OE.*, a goblin; imp. SEA-URCHIN, the echinus, a creature having a spherical shell flattened on the lower side and covered with prickly spines (see ECHINIDÆ).

URDU, n. *ôr'dô* [Hindu *urdu*, an army, a camp, a market]: the Hindustani language as spoken by the Mohammedan population of India. It is really the Hindi language, which is of the Aryan family, with a number of Persian, Arabic, and Turkish words introduced. It is now the language most largely used by Europeans in their intercourse with the natives of India.

URE, n. *ūr* [OF. *eure;* F. *œuvre*, work—from L. *opĕra*, work]: in *OE.*, practice; use.

URE, *yôr*, ANDREW, M.D.: Scottish chemist: 1778–1857, Jan. 2; b. Glasgow. He was educated at Glasgow Univ., but studied medicine at Edinburgh. Returning to Glasgow, he received the degree M.D. 1801. In 1802 he became prof. of chem. and nat. philos. in the Andersonian University (see ANDERSON, JOHN), was active in establishing (1809) an observatory at Glasgow, and was appointed its first astronomer. 1813 he published *Systematic Table of the Materia Medica;* 1818, *New Experimental Researches on Some of the Leading Doctrines of Caloric*, memoir read before the Royal Soc., and which brought U. into notice. 1821 appeared his *Dictionary of Chemistry;* 1822, a paper *On the Ultimate Analysis of Animal and Vegetable Substances*, one of the earliest contributions to organic analysis, and a translation of Berthollet on *Dyeing;* and 1829, a *System of Geology*, in which the hypothesis of a general Flood was maintained. 1830 U. removed to London, and 1834 was appointed analytical chemist to the board of customs. From this time his works assume a technological character, e.g., *Dictionary of Arts, Manufactures, and Mines* (1839), 7th ed. brought out by Robert Hunt in 3 vols. (1875), sup. vol. 1878. U. was a fellow of the Royal Society, and a member of the Geological, Astronomical, and other societies.

UREA, n. *ū-rē'ă* [Gr. *ouron*, urine]: the characteristic constituent of urine; an organic matter which derives its name from its having been originally discovered in the urine: compound, CON_2H_4, or $CO < \begin{matrix} NH_2 \\ NH_2 \end{matrix}$. It was long regarded as an organic base or alkaloid; but is now placed among the *amides*, a group of neutral and for the most part crystallizable compounds, of the *ammonium type* (see TYPES, CHEMICAL), derived from ammonium salts by

abstraction of water, or from acids by substitution of NH_2 (amidogen) for OH (hydroxyl). Pure U. which has been allowed to crystallize slowly, occurs in transparent, colorless, four-sided prisms; but when the crystallization is rapid or disturbed, it separates in small, white, silky needles. It is devoid of smell, has a cooling, saline taste, like that of saltpetre (which it closely resembles in external form), and is very slightly deliquescent. It is readily soluble in water and alcohol, but only slightly in ether. When heated to about 248° F., it fuses, evolves ammonia, and becomes completely decomposed. A solution of pure U. in distilled water may be kept for a long time, but at 212° F. emits ammonia and forms a metallic carbonate. The same change is produced by fusion with the alkaline hydroxides, and when U. is heated with water in a sealed tube to a temperature above 212°:

$$COH_4N_2 + H_2O = CO_2 + 2NH_3.$$

A similar change takes place slowly at ordinary temperatures in the U. contained in the urine, the mucus of the bladder acting as a ferment, and thus rendering urine ammoniacal after it has been kept for a few days.

The following are some of the most important of the compounds of urea. *Nitrate of U.*, $CH_4N_2O.NO_3H$, and *Oxalate of urea*, $(CH_4N_2O)_2C_2H_2O_4$, are readily crystallizable salts, formed by direct addition of the respective acids to a moderately strong solution of urea. As nitrate of U. requires eight parts of cold water, and is still more insoluble if an excess of free nitric acid is present, and the oxalate is more insoluble than the nitrate, while U. dissolves in its own weight of water, these salts may be employed to test for, and approximately determine the quantity of, U. Among the compounds of U. with metallic oxides, those which it forms with the oxides of mercury are especially interesting, and have been completely examined by Liebig. A result of his researches is his celebrated method, now in universal use, of determining the amount of U. volumetrically.

U. occurs as the main and characteristic ingredient of the urine of man and mammals, being most abundant in that of carnivorous, and least so in that of vegetable, feeders. For the average quantity excreted by the human subject, see article URINE. It is also a constituent of the fluids of the eye, of the sweat, and (in minute quantity) of the blood, and of the liquor amnii (of the fetus). There can be no doubt that it is a final product of the regressive metamorphosis of the living tissues, or of their disintegration into simpler compounds, by means of which the final elimination of the worn-out structures is facilitated. Thus, we find that U. may be obtained by oxidizing agents from uric acid, creatine, allantoin, etc., in the laboratory, and there is every reason to suppose that similar changes may occur in the system. Whether, when an excess of food is taken, a portion of it may be formed in the blood into U., and then at once separated without ever having entered into the structure of the higher tissues, is a point not decided.

Until the discovery by Liebig and Wöhler of the artificial formation of U., its only source was the urine, from which, after evaporation, the nitrate was separated, purified by animal charcoal, and the U. liberated by addition of carbonate of baryta, and finally extracted by alcohol, from which it was allowed to crystallize. It is now known that there are many different ways of forming it—as by heating ammonium carbonate to 266°—284° F.:

$$CO < \begin{matrix} NH_2 \\ O.NH_4 \end{matrix} = H_2O + CO < \begin{matrix} NH_2 \\ NH_2 \end{matrix};$$

by action of ammonia on carbonyl chloride:

$$COCl_2 + 2NH_3 + CO(NH_2)_2;$$

or by action of the same on ethylic carbonate:

$$CO(OC_2H_5) = 2NH_3 + 2(CH_5.OH) + CO(NH_2)_2\ ;$$

but the best practical method is essentially that of obtaining it from ammonium isocyanate. In this process potassium isocyanate is dissolved in a little water, and dry neutral ammonium sulphate added, in quantity equal to the cyanate. The whole is evaporated to dryness in a water-bath, and the residue boiled with strong alcohol, which dissolves out the U., leaving the potassium sulphate and excess of ammonium untouched. The filtered solution, concentrated by distilling off a portion of the spirit, deposits the U. in large crystals.

The Compound Ureas are very numerous, and are of two principal classes—viz., the *alcoholic* derivatives, formed by action of amines on cyanic acid, or of ammonia and amines on cyanic ethers; and the *acid-radical* derivatives, which contain acid radicals formed by action of acid chlorides or anhydrides on U.—The compounds of the first class greatly resemble U. in their properties and reactions. They combine with one equivalent of an acid. By boiling with alkalis they are resolved into carbon dioxide and amines. The compounds of the second class, those containing acid radicals, are not capable of forming salts with acids; alkalis decompose them into U. and the corresponding acid.

UREDO, *ū-rē'dō:* genus of minute parasitic fungi, order *Coniomycetes*. The original genus U. has been divided into many genera, forming a group *Uredineæ*, which contains a multitude of species, parasitic on phanerogamous plants of almost every nat. order and in all parts of the world. Different plants have their own peculiar parasites of this kind, or at least the same *Uredineæ* are confined to plants nearly allied. A few species occur on ferns. Every external part of plants, except the roots, is liable to be infested with these fungi; and some of them attack the inner tissues, their spores at length breaking through the outer strata of cells. Submerged parts of plants are never affected by them, for fungi dislike water; but the floating portions of aquatic plants are not exempt; and in all cases a moist atmosphere seems favorable to their development. Rank luxuriance of growth is often attended by their ap-

pearance. A plant once attacked is afterward subject, if perennial, to the same parasite, even if removed to another situation. There is reason to believe that the spores of the *Uredineæ* are taken up by the roots of plants from the soil, and find their way with the sap to the place proper for their growth. See BRAND: BUNT: MILDEW: RUST: SMUT.

UREME'YAH: see OROOMIAH.

URENA, *ū-rē'na:* genus of herbaceous plants, nat. order *Malvaceæ*. The bark is very fibrous. The fibre of *U. lobata* and *U. sinuata*, weeds common in most parts of India, is used as substitute for flax. It is strong and moderately fine.

URETER, n. *ū'rē-tėr* [Gr. *ourētēr*, the passage for the urine—from *ouron*, urine]: in *anat.*, the tube or duct that conveys the urine from the kidney to the base of the bladder. It is about 18 in. in length, and enters the bladder in a slanting direction to prevent regurgitation (see KIDNEYS, THE).

When a concretion is formed in the kidney, the ordinary and most favorable event is that it should descend through the U. to the bladder. The passage of a stone through this tube gives rise to a series of violent symptoms: the patient complains of sudden and severe pain, first in the loins and groin, subsequently in the testes (in the male) under the thigh. The testes are retracted spasmodically; and there are violent sickness, faintness, and collapse, which may last two or three days, being relieved only when the stone reaches the bladder. Treatment consists in the warm bath, and (under medical advice) inhalation of chloroform, or opium in large doses, to allay spasm and deaden pain, free use of diluents to wash down the concretion, and, if the sickness is very severe, an occasional tumbler of hot water containing half a tea-spoonful of carbonate of soda. URETERITIS, n. *ū-rē'tėr-ī'tĭs*, inflammation of the ureter. URETHRA, n. *ū-rē'thrā* [Gr. *ourēthra*]: the canal by which the urine is conveyed from the bladder and discharged. URE'THRAL, a. *-thrăl*, pertaining to the urethra. URETIC, n. or a. *ū-rĕt'ĭk*, a medicine which increases the secretory action of the kidneys; of or pertaining to.

URFA, *ôr'fâ*, or OR'FA: modern name of EDESSA (q.v.).

URGA, *ôr'gâ* (called by the Mongols HURÆ and by the Chinese K'U-LUN): town of Mongolia, administrative centre of the n. and e. Khalkas; on the river Tola, in a valley, 4,100 ft. above sea-level; lat. 48° 20′ n., long. 107° 30′ e.; 350 m. s.e. of Irkutsk, 700 m. from Peking, 168 m. from Kiachta. It consists of two settlements 2 to 3 m. apart—one occupied by Mongols, pop. 10,000; the other by Chinese, pop. 5,000, mostly men—the law forbidding Chinese to bring their wives. The Chinese town, which is the trading quarter, has many substantially-built houses and a generally thrifty appearance. In a suburb of the Mongol town is a Lamaist monastery, the seat of a 'resplendently divine Lama,' ranking as the third dignitary in the Lamaist Church, and metropolitan of the Khalkas: see LAMA. The convent covers a large area and includes the dwell-

ings of the priests. Each family educates one of its children for the Lamaist priesthood. There is a Chinese gov., appointed at Peking.—Total pop. of U. (as above) 15,000.

URGE, v. *ėrj* [L. *urgērĕ*, to press upon, to drive]: to push; to impel; to incite; to press, as an argument or objection; to importune; to press forward; to constrain; in *OE.*, to provoke; to exasperate. URGING, imp. *ėrj'ĭng:* ADJ. pressing with solicitations; importunate. URGED, pp. *ėrjd.* URGENT, a. *ėrj'ĕnt*, pressing; importunate; forcible; cogent. URG'ENTLY, ad. *-lĭ.* URG'ENCY, n. *-ĕn-sĭ*, pressure of difficulty or necessity; entreaty; importunity.—SYN. of 'urge': to animate; instigate; stimulate; encourage; enforce; solicit.

URI, *ō'rē:* one of the Waldstädten or Forest Cantons of Switzerland; part of the Hill Country (see SWITZERLAND) which surrounds the Lake of Lucerne; bounded w. by the cantons of Unterwalden, Bern, and Valais; 415 sq. m. It consists of one valley, that of the Reuss, about 30 m. long, inclosed on all sides by lofty mountain chains, which include the s.e. bay or reach of the lake into which the river falls. A great high-road through the valley ends on the s. at the St. Gothard Pass, connecting the Uri with Ticino, and forming part of one of the great routes into Italy. Uri is almost entirely pastoral. Goats are very numerous. In the low grounds, there are a few fields of corn and potatoes, and gardens and orchards, but even this cultivation is limited. The people speak a Swiss-German dialect and are Rom. Catholics. Uri is a democracy. The landesgemeinde, held in a meadow once a year, is formed of the whole male population who have reached 20 years of age: the highest power resides in this assembly. The preconsideration and superintendence of the law belongs to the *landrath*, of 7 members chosen by the landesgemeinde and 61 by the several communes. A governing council of 11 members, with the landamman as pres., discharges executive functions. Civil justice is administered in the highest instance by a cantonal court of 11 members. A tribunal of 7 members decides in criminal causes. Altorf is the cap., with pop. (1880) 2,901. A fountain surrounded by stone statues of Tell (q.v.) and his son marks, according to the doubtful tradition, the spot where Tell took his aim, and another that where the boy stood with the apple on his head.—Pop. (1870) 16,107; (1880) 23,694; (1888) 17,249; (1900) 19,700.

URIC, a. *ū'rĭk* [Gr. *ouron*, urine (see URINE)]: of or from urine. U'RATE, n. *-rāt*, a salt of uric acid; the common deposits in the urine known as sand or gravel.

U'RIC (formerly LITHIC) ACID ($C_5H_4N_4O_3$): substance named from its being a constituent of urine and of urinary calculi respectively. In a state of purity it occurs in the form of loose white powder or scales consisting of minute crystals, devoid of smell or taste, only very slightly soluble in water (1 part requiring about 15,000 parts of cold and 1,800 of boiling water), and quite insoluble in alcohol and ether. This acid is, however, soluble without decomposition in strong sulphuric acid, and it may be thrown down from this solution by addition of water. It is soluble also in the carbonates, borates, phosphates, lactates, and acetates of the alkalis, extracting from these salts a part of their base, with which it forms acid urates. Litmus paper is reddened by its moist crystals, or by a hot watery solution. This acid is not volatile, and by dry distillation is decomposed into carbonate of ammonia, urea, cyanuric acid, hydrocyanic acid, etc. By action of strong nitric acid on U. A. in the cold is produced *Alloxan*, $C_4H_2N_2O_4$. *Allantoin*, a compound found in the allantoic liquid of the fetal calf, and whose formula is $C_4H_6N_4O_3$, is, producible artificially, together with oxalic acid and urea by boiling U. A. with lead dioxide and water: $2C_5H_4N_4O_3 + O_2 + 5H_2O = C_4H_6N_4O_3 + 2C_2H_2O + 2CH_4N_2O$. This is a most important result in its physiological bearing, since it shows how U. A. is a probable stage toward the formation of urea, and as explaining a probable source of the oxalic acid, often present in the urine in cases of deficient respiration and aeration; and this view is confirmed by the experiment of introducing U. A. into the stomach or veins of an animal, when the presence of oxalate of lime, and the augmentation of urea, are very soon perceived in the urine.

U. A. is a very weak bibasic acid, forming with bases two series of salts, the neutral and the acid, of which the former are the more soluble. Among the most important of these urates are: *Acid potassium urate*, $C_5N_4H_3KO_3$, a sparingly soluble white mass composed of minute needles; *Sodium urate*, the chief constituent of the *chalk-stones* of gout; *Ammonium urate*, also sparingly soluble.

U. A. is widely distributed throughout the animal organism. It occurs not only in the urine of man and carnivorous animals, but is the chief constituent (either free or in combination) of many calculi occurring in the kidneys or bladder, and of numerous urinary sediments. The urinary secretion of birds and reptiles consists almost entirely of urates, which are found also in the excrements of caterpillars, butterflies, beetles, etc., and of many mollusks. Moreover, in very minute quantities it occurs as a urate in healthy blood, in which fluid it has been found in excess in gout and Bright's disease, and is a constituent of the aqueous extract of the spleen, liver, lungs, pancreas, and brain.

The best and most ready mode of obtaining pure U. A. is from the semi-solid urine of serpents, which consists

almost entirely of U. A. and ammonium urate. The mass is boiled with potash, which expels any ammonia that is present; and a stream of carbonic acid is then passed through the strained potash solution, which throws down acid urate of potash. This precipitate is dissolved in water, and decomposed by hydrochloric acid, which throws down the U. A. in minute crystals. It is a glistening, snow-white powder, tasteless, inodorous, very sparingly soluble.

The researches of Wöhler and Liebig on the products of decomposition of U. A. by nitric acid constitute an epoch in organic chemistry. The most important products, some obtained directly, others indirectly, are: *Alloxan*, $C_4N_2H_2O_4$, from which comes a series of acids; *Parabanic acid*, $C_3H_2N_2O_3$; *Alloxantine*, $C_8H_4N_4O_7$; *Murexide*, the ammonium salt, $C_8H_4(NH_4)N_5O_6$, of *purpuric acid*, $C_8H_5N_5O_6$; and *Urea* (q.v.). Of these substances, *murexide* has two special claims to notice: it is used as a pigment in dyeing (though now to a large extent superseded by Rosaniline—q.v.), being probably the old *Tyrian Purple* (see MUREXIDE); and it affords a ready test for a mere trace of U. A. In using it for the latter purpose, the substance supposed to contain U. A. is heated on a slip of glass with a drop of nitric acid, and carefully evaporated to dryness. If U. A. be present, the residue has a red color, which is converted by vapor of ammonia into a fine crimson; and the addition of a drop of a solution of potash develops a splendid purple tint, which disappears on application of heat.

U. A. must be regarded, like urea, as a product of the disintegration of the tissues; and it is probable that all the urea which is secreted may have pre-existed in the form of U. A. Whatever (like excessive exercise or water-drinking) increases the amount of urea, decreases that of U. A., and *vice versâ:* see URINE.

URICONIUM, *ū-rĭ-kō'nĭ-ŭm:* ancient Roman city of Britain, whose site is about four m. e. of Shrewsbury, and is partly occupied by the village of Wroxeter; about 160 m. n.n.w. of London. The original name seems to have been *Viroconium*, and it is mentioned by Ptolemy as existing in the beginning of the 2d c. The remains of the city show it to have been a place of much importance. The wall, still traceable near the banks of the Severn, inclosed a space more than three m. in circumference. The remains have been explored, and many curious relics discovered of Roman civilization in Britain: rings, hair-pins, and combs being numerous. The human remains found, indicating death by violence or by suffocation, make it probable that the city was sacked and burned by enemies perhaps about the 5th c. From about the 12th c. the ruins were used as materials for other buildings: some churches in the neighborhood were built of the old Roman bricks. The most remarkable relic is the *Old Wall*, a great mass of Roman masonry, which appears to have been the side of a great edifice.

URIM, n. *ū'rĭm* [Heb. *urim*, lights; plu. of *ur*, light, flame]: one of the appendages of the breastplate of the high-priest among the anc. Jews. URIM AND THUMMIM, mysterious contrivance in or on the breastplate of the Jewish high-priest, consisting either of the four rows of precious stones on which the names of the 12 tribes were engraved, or more probably of two sensible objects, (conjecturally) symbolizing 'Command' and 'Truth' (LXX.), or 'Utterance' and 'Truth' (Vulgate). [Compare the picture of 'Truth' (Aletheia)—in sapphire or other precious stones—suspended from the Egyptian high-priest's breast.] They seem to have been used as a sort of divine oracle—sometimes giving no answer (1 Sam. xxviii. 6). They are mentioned first in Ex. xxviii. 30, and are never mentioned after Solomon's time. There is no real knowledge concerning their original design or the mode of their later (prob. superstitious) use.

URINARY SED'IMENTS: all those substances which occur in a non-dissolved state in the urine. Most of these sediments are not formed until after the urine has been discharged and has cooled; some, however, are formed in the urinary organs, and under favoring conditions may give rise to urinary concretions. Hence it is important to ascertain whether a sediment occurring in a specimen of fresh urine has been formed before or after its discharge.

The chemical and microscopical characters of these sediments have a double bearing on the detection of disease: (1) From the investigation of these sediments, according to Prof. Vogel, we can draw sure conclusions regarding special changes going on in the general nutrition of the body. They show us that an excessive quantity of certain substances (e.g., uric, hippuric, or oxalic acid) is being discharged with the urine, and has therefore been produced in the body; and we thus often obtain at a glance information of great importance, procurable otherwise by only a tedious process. (2) They point out to us certain local diseases of the urinary system. Thus, from a sediment containing pus, we infer that suppuration is going on in some part of that system; and the presence of cylindrical casts or tubes in the sediment informs us of certain morbid changes in the structure of the kidneys; and if the ordinary symptoms reveal the presence of stone in the bladder, we can ascertain its probable nature from the character of the sediment or gravel.

The mode of formation of morbid sediments is well illustrated by a sketch of the changes which healthy urine undergoes after prolonged exposure to the air. In the course of two or three days the acidity of the urine is found to have increased, and this condition of *acid fermentation* will frequently continue some weeks, giving rise to the deposition of (1) free uric acid; (2) acid urates (chiefly sodium urate); (3) calcium oxalate. In a few weeks, or often much sooner, the urea becomes alkaline, or *alkaline fermentation* is established, in consequence of the urea being converted into ammonium carbonate. The urine now becomes paler, while the red or yellow crystals of

uric acid are replaced by white amorphous granules and colorless refracting prismatic crystals. In other words, the former precipitate is replaced by (1) ammonium and magnesium phosphate; (2) calcium phosphate; (3) ammonium urate. In certain forms of disease these changes take place much more rapidly; and the second change—the alkaline fermentation—may occur without a pre-existing acid fermentation and even within the bladder. In addition to the above-named substances, which arise from decomposition of healthy urine, others occur in various morbid conditions of the system; and we may divide the urinary sediments generally into the two great groups: (1) the unorganized, (2) the organized deposits. The unorganized sediments include uric acid, the urates (chiefly sodium urate), hippuric acid, calcium oxalate, earthy phosphates (viz., calcium phosphate and ammonio-magnesium), cystine, xanthine, hypoxanthine or sarcine (formerly known as guanine), and tyrosine; while the organized sediments include mucus and epithelial scales, blood corpuscles, pus corpuscles, cancerous and tubercular matter, fibrinous casts of the tubes of the kidney, spermatozoa, fungi, infusoria, etc. Of the unorganized sediments, uric acid, the urates (excepting ammonium urate), hippuric acid, and cystine occur only in acid urine; and ammonium urate, ammonio-magnesium phosphate, and calcium phosphate, in alkaline or neutral urine. Oxalate and the organized sediments occur both in acid and alkaline urine; but alkaline urine is the more natural *habitat* for fungi and infusoria. It is comparatively seldom that a sediment consists of a single ingredient. For details regarding the mode of treatment indicated by the most important of the sediments, see LITHIC ACID DIATHESIS: OXALURIA: PHOSPHATIC DIATHESIS.

URINE, n. *ū'rĭn* [F. *urine*—from L. *urīna;* Gr. *ouron*, urine: akin to Skr. *vari*, water: Icel. *ur*, drizzling rain]: a fluid secreted by the kidneys and accumulated in the bladder, from which it is discharged. URINAL, n. *ū'rĭ-năl*, a vessel in which, or a place where, urine may be discharged; an erection in a street for public convenience. U'RINA'RIUM, n. *-nā'rĭ-ŭm*, a place where urine may be stored for manure. U'RINARY, a. *-nĕr-ĭ*, relating to or found in urine: N. a place for storing urine. U'RINATE, v. *-nāt*, to void or discharge urine. U'RINATING, imp. U'RINATED, pp. URINATION, n. *ū-rĭ-nā'shŭn*, the act of discharging urine. U'RINATIVE, a. *-nā-tĭv*, inducing the discharge of urine. U'RINATOR'IDÆ, n. *-tŏr'ĭ-dē:* family of pygopodous birds, i.e. of carinate birds, web-toed, with legs inserted far behind the middle. U'RINIF'EROUS, a. *-ĭf'ĕr-ŭs* [L. *fero*, I bear]: conveying urine. U'RINIP'AROUS, a. *-ă-rŭs* [L. *parĭō*, I produce]: producing urine. U'RINOM'ETER, n. *-ŏm'ĕ-tĕr* [Gr. *metron*, a measure]: an instr. for determining the density of urine. U'RINOUS, a. *-nŭs*, or U'RINOSE, a. *-nōs*, pertaining to urine.

U'RINE: fluid secreted or separated by the kidneys from the blood; the principal means of removing the worn-out tissues, especially the nitrogenous and saline matters, from the system. It is very complex in composition, varying considerably in different classes of animals, and mainly in accordance with the nature of the food.

Healthy human U., freshly discharged, is a clear fluid of bright amber color, bitter saltish taste, and peculiar aromatic odor. Its normal reaction is acid, and its specific gravity ranges from 1·015 to 1·025. It is computed that an adult man of ordinary weight (about 154 lbs.) secretes in 24 hours about 52 fluid ounces (rather more than two pints and a half) of U., the range extending from 40 to 70 ounces; and that these 52 ounces yield, on evaporation, 935 grains of solid constituents, the remainder being water, which is expelled by heat. Of these 935 grains, 520 (or more than an ounce) are composed of Urea (q.v.), and 266 of chloride of sodium (or common salt): while the remaining 149 grains are made up of Uric Acid (q.v.); Hippuric (q.v.) acid; sulphuric acid, 32 grains; phosphoric acid, 54 grains; earthy phosphates, 15 grains; ammonia (in the form of hydrochlorate), 11 grains; with smaller quantities (in most cases mere traces) of Creatinin (q.v.) and Creatin (q.v.), xanthine, hypoxanthine, coloring matters, mucus (from the walls of the bladder), iron, silica, and fluorine. The fluid holds also an undetermined quantity of gases (carbonic oxide and a little nitrogen) in solution. The most characteristic and important of these ingredients is the *urea*, the daily excretion of which is modified by various circumstances. On a purely animal diet, Lehmann found that he secreted two-fifths more urea than on an ordinary mixed diet; on a mixed diet, almost one-third more than on a purely vegetable diet; on a non-nitrogenous diet, the amount of urea was less than half the quantity secreted during a mixed diet. The free use of common salt increases the daily excretion of urea, in consequence, doubtless, of its augmenting the rapidity of the destructive action always going on in all the tissues; while alcohol, tea, coffee, and tobacco (smoked or chewed) diminish the daily quantity. The only medicine which increases its quantity to any marked degree is *Liquor Potassæ*. The daily quantity is increased in many diseases (typhoid fever and many other acute diseases, especially inflammation of the membranes of the brain), while in Bright's disease and a few other disorders it is diminished. The daily amount of excreted *uric acid*, like that of urea, varies with the nature of the food. Prof. Haughton found that the mean daily quantity of uric acid excreted by meat-eaters and wine-drinkers was 4·5 grains, while vegetarians yielded an average of only 1·48 grains, part of which, moreover, was hippuric acid. As an excess of uric acid is likely to give rise to gravel or stone, it should be generally known that the free ingestion of water diminishes its excretion, while at the same time it increases the amount of urea, into which the uric acid is probably transformed by oxidation. The daily amount is diminished by strong bodily exercise, and

increased by repose—the reverse of the effects in relation to the urea. The amount is increased when the digestive functions are disturbed, as after the use of indigestible food or excess of alcoholic drinks; in conditions of the system which are associated with much disturbance of the functions of respiration and circulation; and in disorders accompanied with severe febrile symptoms, such as acute rheumatism. Its entire absence seems compatible with perfect health. With regard to *hippuric* acid, there has been much discussion, not only as to the quantity in which it occurs, but as to whether it actually exists in healthy U. Thus, Weissman, German chemist, found that on a mixed diet he secreted more than 40 grains of this acid daily, and on a purely animal diet only 12 grains. Duchek and Höfle deny that it is a constant ingredient of healthy human U.; and Prof. Haughton met with it only once in the U. of ten men. Dr. Bence Jones, a very trustworthy chemist, found that a man, A, weighing 152 lbs., and a man, B, weighing 202 lbs., living on a mixed diet, excreted daily, on an average, 4·9 and 6·5 grains of hippuric acid, the corresponding quantities of uric acid being 7·7 and 12·6 grains. In cases of jaundice, no traces of hippuric acid are present, even after the administration of benzoic acid, which is usually converted in the system into hippuric acid. Hence it may be inferred that a healthy condition of the U. is essential to the formation of this acid in the system. Nothing is known with certainty regarding the diseases in which this acid is secreted to excess. The only other characteristic ingredient of the U. is its *coloring matter*. Prof. Harley believes that he has isolated the normal urine-pigment, to which he applies the term *urohæmatin;* and from its always containing iron, and on other grounds, he regards it as modified hæmatin or blood-pigment. It has been shown also that indigo-blue, in very small quantity, is almost always present.

The acid reaction presented by fresh healthy human U. depends mainly on the presence of acid phosphates of the alkalis and earths, though the presence of free acids, such as free hippuric or possibly lactic acid (which, however, is not a normal ingredient), may occasionally contribute to increase the acidity. To determine the acidity of the collective 24 hours' U., take a solution of oxalic acid of known strength, and ascertain the relative quantities of a solution (of definite strength) of caustic soda required to neutralize equal volumes of the U. and of the oxalic acid solution. In this way it is found that the total quantity of free acid in the daily U. of a healthy man corresponds in neutralizing power to about 36 grains of oxalic acid. The degree of acidity varies in different parts of the day. The respective acidities of the secretions of the kidneys and stomach are considered to stand in an inverse relation to one another; so that the U. thus loses its acidity, and may even become alkaline during stomachal digestion. It has been found that the effect of a meal on the acidity of the U. begins to show itself in the second hour afterward, is most marked during the next three hours, and disappears

by the end of the sixth hour, the fluid being almost always positively alkaline during the third and fourth hours. Independently of this periodic alkalinity, the U. may be made alkaline at will by administration of caustic alkalis, their carbonates or their salts, with organic acids (citrates, tartrates, etc., such as occur in many fruits); while after administration of acids the acidity is much increased.

In disease the U. may contain either only its ordinary ingredients in abnormal proportions, or ingredients not occurring in the healthy fluid. Thus, there may be excess or diminution of urea; excess of uric acid; diminution of chloride of sodium, which, in cases of inflammation of the lungs, may fall from 266 grains to a mere trace, and, by its daily diminution or augmentation, tells with certainty whether the disease is gaining or losing ground; an excess of coloring matter or of mucus, etc.: or, on the other hand, the U. may contain albumen, sugar, oxalic acid (in combination with lime), fat, leucine and tyrosine, bile-pigment, biliary acids, etc. The subject of 'the urine in disease' is too wide for its details to find space here.

As to the U. of mammals generally, that of the Carnivora is clear, of light-yellow color, disagreeable odor, nauseous taste, and acid reaction: it contains much urea, little pigment, and little or no uric acid. The U. of the Herbivora is turbid, yellow, of less unpleasant odor, and alkaline. In addition to urea, it contains hippuric (but no uric) acid, alkaline lactates, carbonates of potassium and of the earths, calcium oxalate, and a small quantity of phosphates. By reversing the natural food of these classes, we reverse the characters of the urine.

The U. in many forms of disease becomes turbid on cooling, and soon deposits a sediment; and even healthy U., after a few days' exposure to the air, loses its clearness, and throws down a deposit of mucus and various kinds of crystals. The investigation of the nature of the deposits thrown down by comparatively fresh U. in disease is of the highest importance in medicine: see URINARY SEDIMENTS.

U'RINE, INCONTINENCE OF, or ENURE'SIS: troublesome disorder, far more common in childhood than later in life. The child affected—perhaps with no other bad symptoms—is in the habit of discharging urine in bed during sleep, usually without being wakened by the act. This may take place once or several times during the night, and sometimes there is an interval of a night. The habit may often be broken by proper domestic management, as by withholding any excess of fluids before going to bed, and by waking it and making it discharge the contents of the bladder when the elder members of the family retire to bed. If such means fail, recourse must be had to medical advice. Blisters to the sacrum, which prevent the patient from lying flat on the back, and consequently prevent the urine from gravitating toward the most irritable part of the bladder, are often useful; and cold douches to the spine, with internal use of chalybeates, are frequently

serviceable. The most certain remedy, however, is extract of belladonna, to be given only under medical advice. Any attempt by mechanical pressure to prevent the passage of the urine is to be utterly reprobated.

URME'A, or URUMI'A: see OROOMIAH.

URN, n. *ėrn* [F. *urne*—from L. *urna*, a water-pot, a vessel for drawing water: It. *urna*]: a vessel of a roundish form bulging out or swelling in the middle and having a foot or feet; a vessel for keeping water hot at table; a Tea-urn (q v.); a vessel in which the ashes of the dead were kept in anc. times; in *bot.*, the theca or spore-case of mosses. URNAL, a. *ėr'năl*, of or pertaining to an urn.

URODELA, n. plu. *ū'rō-dē'lă* [Gr. *oura*, a tail; *dēlŏs*, visible, apparent]: in *zool.*, the tailed amphibians, as newts, etc.

UROGENITAL, a. *ū'rō-jĕn'ĭ-tăl* [Gr. *ouron*, urine, and Eng. *genital*]: connected with, or relating to, the urinary and genital organs.

UROHYAL, a. *ū'rō hī'ăl* [Gr. *oura*, the stern, the tail; and Eng. *hyoid*, which see]: in fishes, a backward process of the hyoid bone.

UROSCOPY, n. *ū-rŏs'kŏ-pĭ* [Gr. *ouron*, urine; *skopĕō*, I view]: the inspection of the urine in diagnosing disease.

URSA, n. *ėr'să* [L. *ursa*, a she-bear, a constellation]: the bear. URSIDÆ, n. plu. *ėr'sĭ-dē*, the bear-tribe, a family of carnivorous animals (see BEAR). UR'SIFORM, a. *-fawrm* [L. *forma*, a shape]: having the shape of a bear. UR'SINE, a. *-sīn* [L. *ursīnus*]: pertaining to a bear or resembling it; grizzly.

UR'SA MA'JOR ('the Greater Bear') and UR'SA MI'NOR ('the Lesser Bear'): two well-known constellations in the n. heavens.—*Ursa Major* was distinguished in the time of Homer by the names *Arktos*, 'the Bear,' and *Hamaxa*, 'the Wagon,' from a fancied resemblance to these objects. The Roman name Ursa was a translation of the Greek *Arktos*. The seven bright stars of the constellation were called by the Romans *Septemtriones*, 'the seven plowing oxen,' from which, and from their position in the heavens, the adjective *septentrionalis* came to signify north. Throughout Europe the common names of these seven stars are 'the Plow,' 'Charles's Wain,' 'the Wagon;' and in the United States they are more commonly known as 'the Dipper.' When the constellation of Ursa Minor was recognized, *megale*, 'great,' was added to *Arktos* by the Greeks, and *major*, 'greater,' to *Ursa* by the Romans. The group of stars in the hinder part of the Great Bear, being within 40° of the n. pole, never sinks below the horizon of any place of higher latitude than 40° n.—a peculiarity alluded to by Ovid in his *Metamorphoses*. It contains a considerable number of stars, of which 17 are visible to the naked eye; but of these only one (α) is of the first magnitude, two (β and γ) of the second, and eight (among whom are δ, ϵ, ζ, and η) of the third. The accompanying figure shows the arrangement. α and β are

known as 'the Pointers,' from their use in indicating the position of the *Pole-star* (q.v.). A line drawn from the Pole-star through η of the Great Bear, and produced its own length, passes close to the first-magnitude star Arcturus.—*Ursa Minor* is less prominent in the heavens. It was also *Arktos* and *Hamaxa* among the Greeks, and *Arctus* and *Ursa* among the Romans, from the close resemblance of its chief star-group to that of Ursa Major; but was distinctively called *Kynosoura* or *Kynosouris*, and *Cynosura*, 'the Dog's Tail,' from the circular sweep, resembling the curl of a dog's tail, formed by three of the stars in it. The third-magnitude star α in the extremity of the tail of the Little Bear, at present the Pole-star (q.v.), is the brightest in the constellation.

Ursa Major and Ursa Minor.

According to the later mythical stories of the Greeks, Ursa Major was the metamorphosis of Callisto, one of Diana's nymphs, who, having violated her vow, was transformed into a bear, was slain by her son Arcas, and afterward transferred to the heavens as a constellation by Jupiter; Arcas being at the same time metamorphosed into Boötes, the Arktophylax, 'Bear-warden,' of the Greeks. According to another but less common legend, the seven stars of Ursa Major are the oxen of Icarius, and Arktophylax became *Boötes*, 'the Ox-driver.' See BOÖTES.

UR'SINE DAS'YURE: see DASYURE.

URSON, *ėr'sŏn:* quadruped (*Erythizon dorsatum*) nearly allied to the Porcupine, and often called the Canada Porcupine (see PORCUPINE). The U. is about the size of a

Urson (*Erythizon dorsatum*).

small hare. It is found as far s. as Va. and Ky., and as far n. as lat. 67°. Its quills are dyed by the Indian women and worked into ornamental articles of various kinds.

URSULA, *ėr'sū-lâ*, SAINT: saint and martyr of the Roman calendar, especially honored in Germany, particularly at Cologne (q.v.), the reputed place of her martyrdom. The date of her martyrdom is given variously as 238, 283, and 451. According to the revised edition of the Chronicle of Sigebert of Gemblours (Pertz, *Rerum Germanicarum Scriptores*, VIII., 310), 1106 to 1111. U. was daughter of the Brit. prince Deonatus, and was distinguished for her beauty. Holofernes, son of a powerful heathen king, sought her in marriage, and to this her father was forced to assent. U., however, made it a condition that her suitor should become a Christian, and that she should be allowed three years, during which she proposed to make a voyage of pious pilgrimage, accompanied by 11,000 maidens. The conditions were accepted; the maidens were collected, and after exercising in all kinds of manly sports, the expedition set sail in 11 triremes from the British coast, or, as others say, was, in answer to prayer, wafted off by a sudden breeze. Arriving at the mouth of the Rhine, they sailed up the river to Cologne, thence upward to Basel, where, leaving their galleys, they proceeded by land to visit the tombs of the apostles at Rome. This accomplished, they descended the river to Cologne, which, however, had fallen into the hands of an army of invaders, under the headship of Attila. Landing in Cologne in ignorance of this fact, the pious virgins fell into the hands of these heathens, by whom they were all put to the sword, except U., who, for her beauty's sake, was reserved as a prize for the chief, and another (St. Cordula), who had concealed herself in one of the boats. On the following day she gave herself up; and U., refusing to be separated from her slaughtered companions, was also slain. Heaven, however, interposed. A host of angel warriors smote the cruel Huns; Cologne was again set free; and, in gratitude to their martyred intercessors, the citizens erected a church on the site still occupied by the church now known as St. Ursula. The improbabilities and anachronisms of this legend were early observed. The centuriators of Magdeburg (see MAGDEBURG CENTURIES) exposed its weak points with unsparing severity. On the other hand, a Jesuit father, Crombach, has devoted an entire folio vol. to the vindication of the narrative. Many suggestions have been offered in explanation of its most startling improbability—viz., the alleged number of the martyred victims, 11,000. One of these connects the '11,000' with *Undecimilla*, name of a virgin who was really the companion of U.'s martyrdom. The record of the martyrdom in the calendar thus being 'Ursula et *Undecimilla VV.*,' 'Ursula and Undecimilla Virgins,' was easily mistaken for 'Ursula et *Undecim millia VV.*,' 'Ursula and *eleven thousand virgins*.'

Secular inquiries into the origin of the U. legend deny that it has foundation in any historical facts. They find the first traces of the reverencing of these virgins in martyrologies and missals of the latter half of the 9th c., in which mention is made either of a very small number of

virgins whose names are given, or a larger indefinite number without names. After the end of the 9th c. the number 11,000 is found in the calendars. The name of U. does not occur till after the 10th c.; and it was not till the 12th c. that the reverence for U. became predominant over that of the associate virgins. With the 12th c. begins the discovery of the sacred bones. The *ager Ursulinus* was revealed by a vision 1106; and at first single skeletons were raised with great solemnity; but from 1155 the digging up of the field was carried on systematically for nine years, in the course of which thousands of skeletons were found, male as well as female, adults and children, besides coffins, stone tablets with inscriptions, and the like. What the several relics were was revealed to a nun named Elisabeth, then living in the diocese of Trier, to whom the holy martyrs appeared in visions. In this way were identified a pope, an archbishop, several cardinals, bishops, priests, etc. The numerous human remains found in the Ursulan field at the n. side of the city of Cologne have been accounted for by antiquaries by making it out to have been the burying-ground of the ancient Roman *Colonia Agrippina.* The origin of the legend is accounted for by Schade in his work *Die Saga von der Heiligen Ursula* (Han. 1854), on the theory that it is a Christianized relic of old German paganism, in which U. has taken the place of the ancient goddess worshipped by the Scandinavians as Freyja (q.v.), and still remembered by the German people under the names Berchta (q.v.), Hulda (q.v.), etc., and in Sweden by the very title of 'Old Urschel.'

The most learned Rom. Cath. hagiographers—while tracing the origin of the legend to a real historical massacre of a very large number of Christian maidens during the invasion of Attila and soon after the battle of Chalons, 451—are agreed in regarding the details of the narrative, the number, the pilgrimage to Rome, the interposition of the heavenly host, as mere embellishments of the mediæval chroniclers.—See, for the full exposition and vindication of the history, Crombach, *Ursula Vindicata* (fol. Coloniæ 1647); and for a more critical exposition of the historical foundations, Binterim's *Calendarium Eccles. Germ. Colon.* (1824); *Zeitschrift für Phil. u. Kathol. Theologie* (1850); Kellerhoven, *La Légende de Sainte-U.* (1862).

URSULINES, n. plu. *ėr'sū-līnz:* in the *Rom. Cath. Chh.*, a religious order of women, founded in honor of St. Ursula (q.v.) in the first half of the 16th c. by St. Angela Merici, who formed at Brescia an association of young women bound by vow to tend the sick, instruct children, relieve poverty, and engage in similar works of charity. After a time, a rule, in 25 chapters, was projected by Angela, and finally approved by the bp. of Brescia, Cardinal Francis Cornaro. Angela was chosen as the first superior 1537, the community even then numbering 76 sisters. During the lifetime of Angela, and for more than 20 years after her death, 1540, the congregation was confined to the diocese of Brescia; but 1565 a house was opened at Cremona; and

with approval of Popes Gregory XIII. and Clement VIII., the order was spread over many dioceses of Italy. It was warmly encouraged by St. Charles Borromeo (q.v.), and, at his death there were 28 convents of the order in his diocese. Soon afterward it was established in France, where the sisters first formally added to their religious vows the instruction of female children—which has been their chief characteristic. The order was introduced into Savoy by St. Francis de Sales 1635; and 1639 a convent was opened in Quebec, Canada; at Vienna 1660, and at Freiburg, Kitzingen, and Prague soon afterward. The Ursuline sisters have several educational establishments in Ireland, in England, and in the United States. To the U. belongs the honor of having been mainly instrumental in maintaining among Rom. Catholics the education of girls of the higher order through the 17th and 18th c. In this work they have found many competitors among the younger sisterhoods of modern times.—See *Journal des Illustres Religieuses de l'Ordre de Ste. Ursule*, 4 vols. 4to (1690); *Chroniques de l'Ordre des Ursulines*, 2 vols. (Paris 1676).

URTICACEÆ, *ėr-tĭ-kā'sē-ē:* natural order of exogenous plants, consisting of trees, shrubs, and herbs, natives of almost all parts of the world. According to many botanists, U. includes about 600 known species: others restrict it by separating from it several distinct orders, reducing the species to about 300, of which the common nettle may be regarded as the type. The leaves are alternate, furnished with stipules, and generally very rough, sometimes with stinging hairs. The inflorescence is various; the perianth usually divided, but sometimes a mere scale; the stamens inserted into the perianth, equal in number to its segments when it is divided, and inserted at their base; the ovary free, one-celled, containing a single ovule. The fruit is a kind of nut, surrounded by the persistent and sometimes fleshy perianth, sometimes winged. Under this are comprehended *Cannabinaceæ* (q.v.), *Ulmaceæ* (q.v.), *Moraceæ* (q.v.), and *Artocarpaceæ* (q.v.), as well as the restricted U., which have filaments curved in bud, and turning backward elastically when the anthers are bursting, the fruit an unopening nut. The juice of the restricted sub-order *Urticeæ* is watery, not milky; the wood in the arboreous or shrubby species, all tropical, is remarkably soft and light. The fibre of the bark of some is valuable. It is among the restricted U. that species covered with stinging hairs are found. See BŒHMERIA: NETTLE: NEILGHERRY NETTLE: PELLITORY: HEMP: HOP.

URTICACEOUS, a. *ėr'tĭ-kā'shŭs* [L. *urtīca*, a stinging nettle—from *uro*, I burn]: having the character of a nettle. UR'TICAL, a. *-kăl*, pertaining to or allied to the nettles. UR'TICA'RIA, n. *-kā'rĭ-ă*, Nettle-rash (q.v.); a transient inflammation of the skin, characterized by the eruption of small, round, oval-like elevations of a whiter or redder tint than the healthy skin. UR'TICATING, a. *-kā-tĭng*, stinging, as a nettle. UR'TICA'TION, n. *-kā'shŭn*, stinging, as that of a nettle; the process of stinging with nettles.

URUGUAY, *ô-rô-gwī'* or *ū'rô-gwā*, or BAN'DA ORIENTAL' DEL URUGUAY' (*lit.*, 'Eastern Bank of the Uruguay'): small republic of S. America; bounded n. and n.e. by Brazil, e. and s.e. by the Atlantic, s. by the Rio de la Plata, w. by the Uruguay river; extent of the n. frontier 450 m., Atlantic seaboard 120 m.; 73,185 sq. m.; pop. (1901) 925,499. In the s., all along the Rio de la Plata and as far n. as the Rio Negro, the country is a sort of terraced upland, with bold, broken, treeless coast-line, with some excellent harbors; while the shores facing the Atlantic are low and sandy. Further e. rises a woody plateau; but high, bare, grassy plains, traversed by ranges of low hills, seem predominant. The climate is temperate, air pure, and winters mild; rain falls copiously in winter, but is rare in summer. The most important rivers are the Rio Negro, Daiman, Queguay, Yaguaron, and Cebollati. Agriculture is in a backward state, though the soil is naturally rich. Small quantities of wheat, maize, barley, rice, peas, beans, flax, hemp, and cotton are raised, and fruit-trees thrive; but the wealth of the country is in its excellent pasturage, which supports great herds of horned cattle, horses, and sheep. In 1901 there were 39,000,000 acres in pasture; 18,000,000 sheep; 6,000,000 cattle; and 600,000 horses and mules. The wool of U. is of superior quality, and the product yearly is about 25,000 tons. The wild animals are the tapir, deer, ounce, monkey, paca, rabbit, and fox; and large packs of wild dogs infest the plains. U. has almost no manufactures. The chief exports are wool, jerked and salted beef, beef extract, tallow, hides, horn, and hair; chief imports, woolen goods, household furn., sugar, cordage, agricul. impl., timber, etc. In 1901 the imports were valued at $21,389,181; exports $26,774,073; total trade $48,163,254. The foreign and domestic debt 1890, Jan. 1, aggregated $106,646,800. Nearly all imports and exports pass through Montevideo (q.v.), the cap. Other towns of note are Maldonado, Paysandu, and Colonia (see COLONIA DO SANTISSIMO SACRAMENTO).

U. was originally colonized by Spanish settlers from Buenos Ayres, on the other side of the La Plata; but the territory which forms the natural limit of Brazil on the s. was claimed by Portugal, and war between the two nations for its possession ended in favor of Spain. U. was attached to the viceroyalty of Buenos Ayres, and received the name *Banda Oriental*—i.e., the country on the 'eastern bank' of the Uruguay. Its independence was secured by treaty 1828, when it took the title *Republica del Uruguay Oriental.* Like most of the S. Amer. republics, it has suffered from incessant internal discords. The general features of the constitution of 1830 are in force. The executive authority is vested in a pres., and the legislative in an assembly of (1903) 19 senators and 69 representatives.

URUGUAY, *ô-rô-gwī'* or *ū'rô-gwā*, RIVER: stream having its sources in the Sierra do Mar, state of Santa Catarina, Brazil; in s. lat. 28°, w. long. 50°. First it flows w., separating the two states Rio Grande de Sao Pedro and Sao Paulo; then taking a s. course, it forms the boundary between Brazil and the Argentine state of Corrientes; from s. lat. 30°, w. long. 58°, it separates Uruguay from Corrientes and Entre Rios, falling into the Rio de la Plata at the head of its estuary. Its length is 1,000 m.; it is navigable for steamers from its mouth to the Great Falls (Salto Grande), 250 m.; above the Falls the U. is navigable for vessels of not more than 5 ft. draught. The U. is subject to great and sudden rises; and its Sep. and Oct. rise is 20 ft. on the average.

URUMTSI, *ô-rôm'tsē:* city of s. Dzungaria (q.v.), in a fertile district at the n. base of the Thian-Shan (q.v.) Mts. U. has large trade with the adjoining regions.—Pop. about 150,000.

URUS, n. *ū'rŭs* [L. *urus*—from OHG. *ur*, a bison: It. *uro:* F. *ure*]: animal of the ox kind, which anciently inhabited the forests of central Europe, and is described by Cæsar (*Bell. Gall.* VI. 28) as common in the great Hercynian Forest. The U. is described by Cæsar as of elephantine size, and of great strength, swiftness, and fierceness. He states that the horns were very different from those of the oxen of Italy—large, spreading, and sharp. This character is found in the wild cattle of Chillingham and other parks in Great Britain, and in some Highland breeds of oxen; and it seems probable that the U. was the wild original of the domestic ox, and not a bison, nor any now extinct species, as some authors maintain. See monograph by Storer on the *Wild Cattle of Great Britain* (1879).

URVAS'Î: see PURURAVAS.

US, pron. *ŭs* [AS.]: the obj. case of the pronoun *we*.

USAGE, *ū'zāj*, in Law: any practice generally adopted among law-abiding citizens, merchants, traders, etc., which is not contrary to law. In construing the laws of trade, contracts, etc., courts take cognizance of 'known, certain, uniform, reasonable' U. as a means of determining the true intent of parties, the nature and extent of contracts, etc.

USBEGS, *ŭs'bĕgs*, or UZ'BEKS: people of Turkish race, who, at the close of the 15th c., invaded and conquered the numerous principalities into which Turkestan was divided, and have ever since maintained dominion over the country. At the present day they are mostly a settled people, scattered over Russian, Independent, and Chinese Turkestan, occupied chiefly in agriculture and trade. The most probable supposition regarding their origin is that they came from Kiptchak (q.v.), and assumed the name of U. from Usbeg, one of their chiefs. The U. of Khiva, Bokhara, Khokan, and of Chinese Turkestan, differ greatly in language, manners, and customs. Those of Khiva speak a dialect of the Turkish, are honest and generous, and, free from the treachery and duplicity so characteristic of oriental civilization, are fond of music and poetry; and,

though zealous Mohammedans, retain many of their ancient heathen usages. They pride themselves on the purity of their Usbeg descent, but most of them show traces of admixture of Iranian blood. The U. of Bokhara have become largely mingled with the Tajiks, and have consequently lost many of their national characteristics. Those of Khokan are very different from the others, and are as much Kirghis, Kiptchaks, and Kalmucks as they are U.—The fact that the U. have been the dominant race in Turkestan for more than 350 years has given the name such a prestige of nobility and good-breeding that it is generally assumed by such members of other races as settle in cities.

USE, n. *ūs* [L. *usus*, use, employment, practice; *usus*, used; *utor*, I use: F. *us;* It. *uso*, use, usage]: act of employing in any manner; state of being converted to any purpose; occasion or need to employ; the quality which makes a thing proper for a purpose; benefit; advantage: habit; custom; in *law*, profit; benefit; in *OE.*, common occurrence; usury; interest paid for money. USE, v. *ūz* [F. *user*—from mid. L. *usārĕ*, to use]: to employ; to apply or handle for some purpose; to consume; to accustom; to render familiar by practice; to inure; to be accustomed; to be wont; to treat; to practice; to frequent. USING, imp. *ū'zĭng*. USED, pp. *ūzd*. USABLE, a. *ū'zŭ-bl*, that can be used. USAGE, n. *ū'zāj*, a series of actions done by one person toward another which affect him for good or evil; treatment; custom; practice; habit; manner of using, as a word or phrase. USANCE, n. *ū'zăns*, the period after date allowed by custom for the payment of bills of exchange drawn on some distant place; owing to improved means of communication, the tendency is to shorten this period, and usance now runs commonly from 14 days to 4 months; in *OE.*, proper employment; interest. USEFUL, a. *ūs'fŭl;* conducive to a good end; suited or adapted to the purpose; profitable; serviceable. USE'FULLY, ad. *-lĭ*. USE'FULNESS, n. *-nĕs*, the state or quality of being useful. USE'LESS, a. *-lĕs*, worthless; fruitless; unavailing; ineffectual. USE'LESSLY, ad. *-lĭ*. USE'LESSNESS, n. *-nĕs*, the state or quality of being useless. USER, n. *ū'zĕr*, one who uses. USUAL, a. *ū'zhū-ăl*, customary; such as ordinarily occurs. U'SUALLY, ad. *-lĭ*, commonly. U'SUALNESS, n. the state of being usual. IN USE, in employment; in customary practice. USE AND WONT, the common or customary practice. USE-INHERITANCE, inheritance of the effects of use or of disuse in organisms. TO USE UP, to leave nothing of; to exhaust; to tire out thoroughly.—SYN. of 'use, n.': convenience; help; practice; habit; usage;—of 'usefulness': utility; serviceableness; value; advantage; benefit; profit.

USE, in Law: the old name for *Trust* (q.v.). Uses and trusts correspond to the *fidei commissum* of the Roman law. A use was a confidence reposed in another who was tenant of the land, or *terre-tenant*, that he should dispose of the land according to the intention of the *cestui que use*, or him to whose use it was granted, and suffer him to take the profits.

USEDOM, *ō'zĕh-dom:* island belonging to Prussia; at the mouth of the Oder and with the island of Wollin shutting off Stettiner-Haff from the Baltic. It is of very irregular shape, being much indented by branches of the Haff; is 34 m. in extreme length, and 15 m. broad; about 206 sq. m. On its n.e. side is the port of Swinemünde (q.v.); on the s.w. side is the small town of U.—Pop. of island 30,000; of town (1885) 1,825.

USE AND OCCUPATION, in Law: technical name for the beneficial enjoyment of premises by a tenant who occupies the real property of another. In all cases where a person has had use and occupation of another's premises, with the assent of the owner, an action lies for the value thereof, which value corresponds to rent under an ordinary lease. Hence, where it is doubtful whether there has been a valid lease executed between the parties, the landlord can recover rent under the head of *use and occupation.*

USHANT, *ŭsh'ant* (F. *Ouessant*): island in the Atlantic Ocean, belonging to France, and included in the dept. of Finisterre, from whose w. coast it is distant about 17 m. It is the largest of a small group of islets called *Iles d'Ouessant,* and has 7 sq. m. The coasts are escarped and difficult of access; the soil is fertile. The inhabitants are employed in fishing, and in rearing cattle and horses. —Pop. (1886) 2,307.

USHAS, *ū'shas* [from Skr. *ush,* 'to shine, to burn,' and kindred with the Greek *ēōs* or *heōs* and the Latin *aurora,* 'the Dawn']: one of the female deities of the Vedic religion of India (see INDIA—*Religion*), and among these is invoked with special predilection by the poets of the R'igveda hymns. U. is one of the most pleasing goddesses of the ancient Hindu pantheon. She is frequently addressed as 'the daughter of heaven,' 'the daughter of night' (night being the precursor of the dawn). She is sister of the two luminous deities *Bhaga* and *Varun'a,* and faithful wife of *Sûrya,* the sun. Another god who originally on physical grounds is associated with Ushas is *Indra* (q.v.), ruler of the bright firmament. She is associated also with Soma (q.v.).

USHER, n. *ŭsh'ĕr* [OF. *ussier*—from L. *ostiārĭus,* a door-keeper—from *ostĭum,* a door: It. *usciere*]: an official who introduces strangers to a presence-chamber or who walks before a person of rank; a person who meets people at the entrance of a hall, church, theatre, or the like, and escorts them to seats; an inferior officer in some English courts of law; a subordinate teacher in a school: V. to give entrance to; to accompany and introduce; to introduce. USH'ERING, imp. USH'ERED, pp. *-ĕrd.* USH'ERSHIP, n. the office of an usher. USHER OF THE BLACK ROD, an officer of the order of the Garter (q.v.), who is first gentleman usher of the court in Great Britain, and thus one of the chief officers of the house of peers. The rod from which his title is derived is 3½ ft. long, of ebony, mounted with gold. It is one of the functions of the gentleman usher of the black rod, or of his deputy, known as the yeoman

usher of the black rod, to request the attendance of the commons in the house of lords when the royal assent is to be given to bills by the sovereign or by lords commissioners; also to execute orders of commitment for breach of privilege and contempt, and to assist at the introduction of peers, and other ceremonies of the upper house. USHER OF THE GREEN ROD, one of the officers of the order of the Thistle (q.v.), whose duties consist in attendance on the sovereign and knights assembled in chapter, and at other solemnities of the order. The rod is of green enamel, 3 ft. in length, ornamented with gold.

USH'ER, JAMES, D.D.: scholar and prelate, Bp. of Meath, and Abp. of Armagh: 1580, Jan. 4—1656, Mar. 21; b. Dublin; of one of the oldest Anglo-Irish families. His uncle, Henry U., preceded him in the archbishopric of Armagh. At the age of 13 U. entered Dublin College, where his predilection for history soon revealed itself. Having resolved to enter the priesthood, he proceeded to read up the entire literature of ecclesiastical antiquity—a task which occupied him from his 20th to his 38th year. He was ordained deacon and priest 1601, and was soon appointed preacher at Christ Church, Dublin. In 1607 he was chosen to the chair of divinity, and filled it for 13 years. In 1609, in one of his visits to England, he made the acquaintance of the most distinguished scholars of the age. In 1613 he published *De Ecclesiarum Christianarum Successione et Statu*, designed to be a continuation of Bp. Jewel's *Apology*. The work was in three parts, of which only the first, reaching to Hildebrand, and part of the second, were finished. At a convocation of the clergy at Dublin, 1615, he was appointed to draw up a series of articles (the number amounted to 104) relating to the doctrine and discipline of the Irish Prot. Church. In these the doctrines of predestination and reprobation (of which U. was an unflinching apologist) found prominence. These views, and others—e.g., that bishops were not an *order* different from presbyters, that the 'Sabbath' should be strictly enforced, that no toleration should be granted to Rom. Catholics—laid him open to a charge of Puritanism; but as his loyalty to the principle of monarchy was undoubted, he suffered no diminution of royal favor: on the contrary, King James promoted him to the bishopric of Meath 1620; and 1623 constituted him a privy councilor of Ireland. Two years later he was made abp. of Armagh, and in his official capacity vigorously opposed the toleration of popery and the spread of Arminianism. In 1632 U. pub. *Veterum Epistolarum Hibernicarum Sylloge*, a collection of letters from anc. MSS., on the state of the Irish Church 592–1180; *Emmanuel, or a Treatise on the Incarnation of the Son of God* (1638); *Britannicarum Ecclesiarum Antiquitates* (1639), said to contain a most exact account of the British Church, from the first planting of Christianity, 20 years after the crucifixion, to the end of the 7th c.; *The Judgment of Dr. Reynolds concerning the Original of Episcopacy Defended, The Original of Bishops, The Power of the Prince and the Obedience of the*

Subject, etc. (1641). When the civil war broke out, U., who was in England, espoused the side of the king, was offered a seat among the Assembly of Divines at Westminster, but declined it, and made himself very obnoxious to parliament by his sermons at Oxford. When the fortunes of the king began to decline, U. left Oxford; his property and revenues in Ireland were seized, and, after a residence in Wales and elsewhere, he went to London 1647, where, in spite of his royalist sympathies, he was chosen by the benchers preacher of Lincoln's Inn, a post which he retained till his death. Cromwell, who had great respect for his learning, ordered his remains to be interred with great magnificence in Erasmus's Chapel, Westminster Abbey.—U. was a man of undoubted ability and of enormous erudition, the most learned prelate that ever adorned the Irish Prot. Church, pious and free from worldly ambition; but he lacked force of character, real insight and intellectual power; hence, though pronounced by Dr. Johnson 'the great luminary of the Irish Church,' he exercised less influence over the course of contemporary events than some of the humblest of Cromwell's Ironsides. Besides those already mentioned, U.'s chief works are: *De Romanæ Ecclesiæ Symbolo* (1647); *Dissertatio de Macedonum et Asianorum Anno Solari* (1648); and *Annals of the Old Testament* (1650–54), a chronological work. After his death there were pub. (from his numerous MSS.), *Chronologia Sacra*, etc. (Oxford 1660), by which and his *Annals* he is most widely known; a volume of *Sermons; Historia Dogmatica Controversiæ inter Orthodoxos et Pontificios de Scripturis et Sacris Vernaculis* (Lond. 1690); *A Collection of three hundred Letters written to James Usher, Lord Archbishop of Armagh*, to which is prefixed a life of the abp. by his chaplain, Richard Parr, D.D. (Lond. 1686). A collected ed. of U.'s works, by Elrington & Todd, in 17 vols., with a new biography, was pub. Dublin 1847–64. U.'s *chronology* of the biblical history, long the standard in Great Britain and the United States, and often printed on the margins of Bibles, is purely arbitrary, and is of no authority among modern scholars for periods in remote antiquity.

USKUP, *ŏs'kŭp*, or Us'KUB, or SCOPIA, *skō'pĭ-a* (Servian *Skoplie*): town of European Turkey, cap. of vilayet of Kossova, on the Vardar, 160 m. n.w. of Salonica. It is on hilly ground; and contains 16 mosques, with black domes and minarets, interspersed among fruit-trees. Here are the ruins of an ancient Roman aqueduct of 55 arches. The inhabitants are engaged in leather-making, weaving, dyeing, orcharding, etc.—Pop. 28,000.

USNEA, *ŭs'nē-a:* genus of lichens having a much-branched thallus, with an elastic thread in the centre. They grow on trees, are generally pendulous, and contain the vegetable principle *Usnine*, which is found also in many other lichens. They are sometimes used in dyeing, like archil and cudbear. From their appearance, many of the species of U. receive the popular name BEARD-MOSS.

USQUEBAUGH, n. *ŭs'kwĕ-baw'* [Gael. *uisge-beatha*, lit., water of life]: a strong distilled spirit, slightly aromatic, made in Ireland and Scotland; whisky.

USTILA'GO: see SMUT.

USTULATE, a. *ŭs'tū-lāt* [L. *ustulātus*, pp. of *ustulārĕ*, to scorch—from *urĕrĕ*, *ustum*, to burn]: in *bot.*, blackened as if burned. US'TULA'TION, n. *-lā'shŭn*, the roasting or drying of moist substances to prepare them for pulverizing; the burning of wine.

USUAL: see under USE.

USUCAPTION, n. *ū'zū-kăp'shŭn* [L. *usucaptus*, pp. of *usucapĕrĕ*, to acquire ownership of a thing by long use—from *usus*, use; *capĕrĕ*, to take]: in *civil law*, the title or right to property acquired by the uninterrupted and undisputed possession of it for a certain time.

USUFRUCT, n. *ū'zū-frŭkt* [mid. L. *usufructus*—from L. *usus*, use; *fructus*, fruit: F. *usufruit*]: in *law*, the right of using and enjoying the profits of a thing belonging to another without impairing the substance or without alienating it; Liferent (q.v.). U'SUFRUC'TUARY, n. *-tū-ėr-ĭ*, one who enjoys usufruct over anything: ADJ. of or pertaining to usufruct.

USURER, USURIOUS, etc.: see under USURY.

USURP, v. *ū-zėrp'* [F. *usurper*—from L. *usurpārĕ*, to seize to one's own use—from *usus*, use; *rapĭō*, I seize: It. *usurpare*]: to seize and hold by force and without right; to assume improperly; to arrogate; to appropriate. USURP'ING, imp. USURPED', pp. *-zėrpt'*. USURP'ER, n. *-ėr*, one who occupies the power or property of another without right. USURPATION, n. *ū'zėr-pā'shŭn* [F.—L.]: seizure and possession without right—applied particularly to the taking possession of a throne or sovereignty. USURPATORY, a. *ū'zėr-pă-tėr-ĭ*, marked by usurpation. USURP'INGLY, ad. *-lĭ*.

USURY, n. *ū'zhû-rĭ* [F. *usure*, usury—from L. *usūrā*, use, interest, usury—from *usus*, pp. of *utor*, I use: It. *usura*]: an illegal or very exorbitant rate of interest for money lent; the practice of taking exorbitant interest for money lent (see INTEREST); in *OE.*, interest. U'SURER, n. *ū'zhėr-ėr*, one who lends money at an illegal rate of interest; one who charges an exorbitant rate of interest; in *OE.*, a money-lender. USURIOUS, a. *ū-zhô'rĭ-ŭs*, taking an exorbitant rate of interest for money. USU'RIOUSLY, ad. *-lĭ*. USU'RIOUSNESS, n. *-nĕs*, the state or quality of being usurious. USURING, a. *ū'zhû-rĭng*, in *OE.*, of or pertaining to money-lending.

UT, n. *ŭt*: among the *French*, the first note of the musical scale, called by other nations *do*.

UTAH, *ū'tâ:* state; one of the United States of America; 45th in order of admission into the Union, 32d under the federal constitution; created a state from the terr. of U., and admitted 1896, Jan. 4; named from the Utah or Ute tribe of Indians (see UTES).

Location and Area.—U. is in lat. 37°—42° n., long. 109°—114° w.; bounded n. by Ida. and Wyo., n.e. by Wyo., e. by Colo., s. by Ariz., w. by Nev.; extreme length 345 m., extreme breadth 275 m., water surface 2,780 sq. m., land surface 82,190; total 84,970 sq. m. (54,380,800 acres); greatest elevation 13,500 ft. above sea-level (Mt. Tohkwano and Hayden Peak); cap. Salt Lake City.

Topography.—The whole state possesses large physical interest. It is divided into two parts by the Wahsatch Mountains, which cross it from n.e. to s.w., the w. part belonging to the Great Basin, with no river outlet to the ocean, and the e. part to the Rio Colorado drainage area. The most striking physical features are the Wahsatch Mts. and the High Plateaus, forming a central zone 9,000—11,000 ft. above sea-level; the Uintah Mts., stretching e. from about the middle of the Wahsatch, a table-land with peaks 12,000—13,500 ft. high; the Tavaputs Table-land, extending from the s. extremity of the Wahsatch e.s.e. beyond the boundary of the state; the Uintah White basin, between the Uintah Mts. and the Tavaputs Table-land, with ample drainage on the e. and w.; the Cañon lands s. of the Tavaputs Table-land and e. and s. of the High Plateaus, where the Green and the Grand rivers unite to form the Rio Colorado, and where there are numerous deep and picturesque cañons, nearly all traversed by streams of considerable size; and the Great Basin, subdivided into the Sevier Lake basin and the Great Salt Lake basin, a region of low valleys w. of the lofty zone, interrupted by spurs of a mountain system extending through Nev. and into Ida. and Or. The region of the Great Basin abounds in lakes, of which the chief are Great Salt Lake, 100 m. long, 50 m. wide, 1,900 sq. m. area, whose waters contain about 22 per cent. of pure salt, and are wholly destitute of fish; Utah Lake, 45 m. s., 130 sq. m., whose waters are fresh and pure; and Sevier, Little Salt, Preuss, and Fish lakes, all further s., and without apparent outlets. Great Salt Lake receives the Bear, Weber, and Jordan rivers, each having several tributaries, and is connected by the Jordan with Utah Lake, which also receives a number of large tributaries from the Wahsatch Mountains, including the Provo, American Fork, Spanish Fork, and Hobble, Payson, and Salt creeks. As far as known the lakes receive all the rivers in the Great Basin region. In the e. part the drainage is chiefly by the Rio Colorado and its tributaries, notably by the San Rafael, Uintah, Dirty Devil, White, Green, Grand, and San Juan rivers. The Great Basin drainage area is about three-fifths and the Rio Colorado area about two-fifths of the whole area; the former is

divided into the Great Salt Lake district of 837,660 acres of irrigable land, and the Sevier Lake district of 101,700 acres, and the latter into the Uintah White basin of 280,320 acres and the Cañon lands of 213,440 acres.

Climate.—The mean annual temperature ranges from 48°·65 in the n. to 51°·51 in the s., and 38°—40° e. of the Wahsatch Mountains, and 46°—52° w. The inhabited parts range in altitude 4,300—6,300 ft., but 70 per cent. of the population is settled in valleys scarcely exceeding 4,500 ft., and 60 per cent. in the valleys of Great Salt Lake and Utah Lake, where the air is dry, clear, and pure. The average rainfall is 16 in., excepting in the Great Salt Lake region, where it is 20 in., and rain is most abundant in the valleys Oct.—Apr., the remainder of the year being dry and hot. Spring opens in May, winter generally early in November.

Geology.—Clarence King pronounces the greater part of the rock of the interior mountain area to be a series of conformable stratified beds reaching from the early Azoic to the late Jurassic times. The raising of these beds produced the Sierras, the Wahsatch, and the parallel ranges in the Great Basin. Afterward the Pacific Ocean on the w. and the ocean that filled the Mississippi basin on the e., created a system of cretaceous and tertiary strata. It is observed that all the structural features of the local geology are nearly parallel with the meridian; hence the precious metals are found arranged in parallel longitudinal zones. Maj. Powell believes that the present Great Basin was the first part of the w. to emerge from the sea, that during the whole of the Mesozoic period the basin was drained into a sea which covered the Wahsatch, the Uintahs, and the High Plateaus, and that the Great Plains and the Great Basin were raised to their present altitude at the beginning of the Cenozoic period, where the uplifting of the continent between St. Louis and San Francisco began. For details concerning the physical and geological features of the terr., see the publications of the U. S. Geological Survey. The economic properties are gold, silver, lead, and copper, mined chiefly in Beaver, Juab, Summit, Salt Lake, Tooele, and Washington cos.; coal on both sides of the Wahsatch and the High Plateaus for almost the entire length of the terr., with principal mines in Emery and Summit cos.; brimstone near Cove Creek; antimony along the Sevier river; asphalt and oil with asphalt base (similar to that in Trinidad) on Green river; gilsonite or uintahite, yielding 99 per cent. of asphalt with the oil dried out, on the lower Duchesne and the lower White rivers; rock salt on Salt Creek and common salt on Great Salt Lake; and iron ore in various parts, but particularly in Iron co. The principal forest growths are fir, spruce, pine, cedar, maple, oak, mountain mahogany, and quaking ash.

Mining.—Some attempt at mining was made about

1865, but the lack of facilities of transportation retarded the industry. In 1869 the Union Pacific and the Central Pacific railroads united their tracks on the summit of Promontory Range, and the event gave such an impetus to mining that there were produced 1871–87 ores and bullion of the following values, silver being reckoned at its coining value: gold $3,065,691.72; silver $84,129,-668.88; lead $33,799,599.17; and copper $3,003,889.21—total $123,998,848.98. The output in 1901 was officially stated as: copper 20,116,979 lbs. against 3,919,010 in 1897; refined lead 49,870 short tons, against 23,190 in 1894; coal 1,147,027 short tons, of which 1,082,723 tons were loaded at the mines for shipment; gold 10,760,800 fine oz., valued at $3,690,200; silver (1900) 9,267,600 fine oz., valued at $3,972,200; val. stone (1901) chiefly sandstone and limestone $123,727; of clay products $291,-189; gypsum 2,500 tons; salt 334,484 barrels, valued at $326,016; mineral waters 51,500 galls.

Agriculture.—Following table gives number, acreage, and value of farms by U. S. census repts. 1880-'90-1900.

Farms.	1880.	1890.	1900.
Number of farms.....	9,452	10,517	19,387
Acreage of farms.....	655,524	1,323,705	4,116,951
Value of farms.....	$14,015,178	$28,402,780	$75,175,141

In 1894, exclusive of two cos. not reporting, there were 20,581 farms, on which $718,929 was expended during the year for buildings and $610,820 for interest and taxes. The irrigated area was 417,455 acres, pasturage fenced 294,725, and improved land 806,650. There were 17,453 farmers free of incumbrance and 2,128 mortgaged for an aggregate of $1,971,352. On the farms 5,960 laborers were employed, to whom $1,015,366 was paid in wages. In 1900 there were reported 19,387 farms, covering 4,116,951 acres, of which 1,332,117 acres were improved and 3,084,834 unimproved; and farm property, including $50,778,350 in buildings, $2,922,550 in implements and machinery, and $21,474,241 in live stock was valued at $75,175,141. The following table shows the acreage, yield and value of the principal farm crops for the calendar year 1902, as compared with 1880:

Crop.	1880.		1902.		
	Acreage.	Yield.	Acreage.	Yield.	Value.
Corn.....	12,007	163,342 bu	10,810	217,281 bu	$145,578
Wheat.....	72,542	1,169,199 "	176,824	3,748,669 "	2,848,988
Oats.....	19,525	418,082 "	44,970	1,596,435 "	750,324
Rye.....	1,153	9,605 "	3,493	43,313 "	26,421
Barley.....	11,268	217,140 "	8,466	271,759 "	160,338
Potatoes.....	.....	573,595 "	10,609	1,665,613 "	749,526
Hay.....	65,214	92,735 t	337,731	884,855 t	6,407,139

The number of animals reported on the farms and ranches 1880 and 1902 was as follows:

Animals.	Number 1880.	Number 1902.	Value 1902.
Horses	38,131	104,266	$3,920,265
Mules	2,898	2,024	92,180
Milch cows	32,768	68,808	2,258,279
Oxen and other cattle	62,648	254,326	4,997,689
Sheep	233,121	3,570,070	8,561,386
Swine	17,198	58,575	535,961
Total	386,764	4,058,069	$20,365,760

The wool clip 1880 was 973,246 lbs.; 1902,16,900,000 lbs.

Manufactures.—The following table gives a comparison of the manufacturing industries in 1890 and 1900, and details of the principal ones, arranged in the order of value of output, in 1900, according to the revised census returns. In 1890 the total capital employed in manufacturing was $6,583,022, and in 1900, $14,650,948.

Principal industries	Estab	Hands employed.	Wages Paid.	Cost of materials.	Value of products.
All industries 1900	1,400	6,615	$3,388,370	$12,853,954	$21,156.183
All industries 1890	531	4,980	2,715,805	4,252,036	8,911,047
Increase	869	1,635	672,565	8,601,934	12,245,136
Flour and grist mill products	80	167	82,979	1,401,819	1,829,840
Printing and pub	80	548	287,563	203,328	770,848
Confectionery	24	163	57,357	224,307	440,044
Malt liquors	7	89	53,756	120,995	432,835
Clothing, men's custom work and repairing	62	213	122,808	131,446	397,232
Blacksmithing and wheelwrighting	187	117	58,022	101,175	344,365
Slaughtering and meat-packing	5	34	14,978	291,477	343,444
Lumber and planing mill products	28	16	63,617	116,278	252,187
Woolen goods	3	140	52,558	156,048	225,986
Foundry and machine shop prod	6	194	69,681	121,828	222,343

In 1900 there were reported 1,400 manufacturing establishments, employing $14,650,948 capital and 6,615 persons, paying $3,388,370 for wages and $12,853,954 for materials used, and yielding products valued at $21,156,183.

Trade Interests.—A summary of the wholesale and retail trade in the calendar year 1894 shows: Number of stores 1,974; capital invested $14,551,345; persons employed 5,023; wages paid $2,685,794; and aggregate sales $32,865,611.

Transportation.—The railroad system 1895, June 30, comprised 543·3 m. of broad gauge and 37 m. of narrow gauge of the Union Pacific road; 484·79 m. of broad gauge and 11·3 m. of narrow gauge of the Rio Grande Western road; 165·5 m. of broad gauge and 41·55 m. of narrow gauge of the Central Pacific; 60·25 m. of narrow gauge of

the Sanpete Valley road; 17·4 m. of broad gauge of the Great Salt Lake and Hot Springs road; and 15 m. of broad gauge of the Salt Lake and Los Angeles road—total, 1,376.09 m. There were also 84 m. of electric and 6 m. of steam street railways. Reports of the corporations controlling the steam railroad systems for their fiscal year 1894 showed: Capital stock $17,670,000; funded debt $17,143,000; total investment $35,182,765; cost of roads and equipments $31,590,272; gross earnings $2,278,968. The total mileage in 1901 was 1,571.

Finances.—In 1895 the bonded debt was $100,000, represented by building bonds $300,000 and territorial bonds $400,000, and there was a floating debt of $100,000. The revenue, comprising a territorial tax of 2 mills and a school tax of 3 mills, was $489,427.05. The assessed valuations 1895 were: Real estate $48,778,893; improvements thereon $20,164,688; personal property $17,266,377; and railroad and other corporation property $11,787,193.87—total $97,942,151.87. In 1902, Oct. 1, the bonded debt was $900,000 and the assessed valuation $118,019,462. The state owns public institutions and other property valued at more than $1,750,000.

Banking.—Official reports for 1895, Oct. 31, showed that there were 11 national banks in operation and 6 in process of liquidation. The active banks had a combined capital of $2,100,000; U. S. bonds on deposit $812,500; circulation, issued $2,727,190, redeemed $1,922,825, outstanding $804,365; loans and discounts $2,894,523; deposits $2,961,674; reserve required $444,251; reserve held $1,281,285; and ratio of reserve 43·26 per cent. During the year ending 1895, Sep. 30, the exchanges at the United States clearing-house at Salt Lake City aggregated $63,012,914, an increase of $9,889,836 over those of the preceding year. The state banks (July 29) numbered 6, with combined capital $565,000; deposits $290,767; loans and discounts $582,447; resources $966,518; and surplus $61,781. In 1902, June 30, there were 11 national banks, with cap. of $1,597,500; surplus $402,558; 21 state banks with cap. of $1,571,800; surplus $109,834; 12 private banks with cap. of $142,000; surplus $6,500; 2 loan and trust companies with capital of $280,000, surplus $11,000.

Education.—In 1902 the number of children of school age was est. at 24,400, of whom 19,770 were enrolled in the public schools established under the territorial free-school law of 1890. In 1895 39,821 were in av. daily attendance. There were 1,115 teachers (male 470, female 645); school was kept an average of 152 days; and the expenditures were $963,151. The principal institution for higher education is the State Univ. (see UTAH, UNIVERSITY OF). Among the denominational and private secondary schools are Brigham Young College, Logan, 1877 (Latter-day Saints); New Jersey Academy, Logan (Presb.); Central Seminary, Mill Creek (L. D. S.); Wasatch Academy, Mount Pleasant, 1875 (Presb.); Ogden Military Academy, Ogden (non-sect.); Proctor Academy, Provo City, 1887 (Congl.); Brigham Young Academy, Provo City, 1876

(L. D. S.); All Hallows College, Salt Lake City (Rom. Cath.); Latter-day Saints College, Salt Lake City; Rowland Hall, Salt Lake City, 1881 (Prot. Episc.); Salt Lake Academy, Salt Lake City (Congl.); Salt Lake Collegiate Institute, Salt Lake City, 1875 (Presb.); St. Mary's Academy, Salt Lake City, 1875 (Rom. Cath.); Sacred Heart Academy, Ogden (Rom. Cath.); St. Mark's School, Salt Lake City, 1867 (Prot. Episc.); St. John's School, Logan (Prot. Episc.); St. Paul's School, Plain City (Prot. Episc.); and Proctor Acad., Provo (Congl). The State Agricultural and Mechanical College, at Logan, had (1901) experimental station staff 7, faculty 22, students 380, area under cultivation 103 acres, value $26,800, and special buildings and equipments valued at $158,000. There is also a large number of denominational primary schools. In the Utah School for the Deaf, at Salt Lake City, instruction is given in carpentry and joinery, shoemaking, printing, and sewing.

Religion.—According to the revised census report on statistics of churches issued 1895, U. had in the census year 427 religious organizations, 280 church edifices (and 157 halls used for religious purposes), 128,115 communicants, and church property valued at $1,493,791. The following table gives in detail the denominational statistics, omitting halls in column of 'edifices':

Denominations.	Organizations.	Edifices.	Members.	Value of church property.
Advent	2	....	37	.....
Reg. Bapt., N	4	3	327	$65,000
Rom. Cath	28	12	5,938	68,000
Christ. Scientists	1	....	100	.....
Congregational	14	2	460	76,000
Disciples of Christ	2	....	270	.....
Jewish	1	1	100	40,000
Latter-day Saints	307	192	118,201	736,916
Luth. Ind. Synods	4	...	84	.....
Methodist Episcopal	31	29	1,048	223,650
African Methodist	1	....	7	.....
Presbyterians, North	20	31	688	212,975
Protestant Episcopal	10	10	751	71,250
Salvation Army	1	....	4	.....
Spiritualist	1	....	80	.....

The Rom. Cath. Church has the diocese of Salt Lake City, and the Prot. Episc. Church has created the missionary district of Nevada and U., with a bishop for the latter resident at Salt Lake City.

At the tenth international Sunday-school convention held in Denver, 1902, June 26-30, there were reported in U. 135 evangelical Sunday schools, 1,245 officers and teachers, and 7,053 scholars—total members 8,298.

Libraries.—According to the govt. report on public libraries in the United States of 1,000 vols. and upward each 1900, U. had 13 libraries, containing 68,807 bound vols., and 19,694 pamphlets. The libraries comprised 4 general and 8 school.

Illiteracy.—In 1880 there were 97,194 persons 10 years old and upward enumerated, of whom 4,851 were unable

to read, and 8,826 unable to write. The percentage of total illiterates was 9·1; of native white illiterates 5·9; and of foreign white illiterates 11·8. In 1890 the number 10 years old and upward enumerated was 147,227, of whom 8,232 were classified as illiterates, or 5·6 per cent. Of 145,-437 whites, 7,407, or 5·1 per cent., were illiterates; of native whites, 2,219, or 2·3 per cent.; and of foreign whites, 5,188, or 10.3 per cent., were so classified. In 1900 there were 2,470 males of voting age who were illiterate, including 490 native whites and 531 aliens.

History.—U. was settled by the Mormons under Brigham Young (q.v.) 1847; was ceded by Mexico to the United States 1848; was organized as a terr. 1850, and was admitted into the Union 1896, Jan. 4. The Mormons named the place Deseret, signifying 'the land of the honey-bee,' and Young was the provisional as well the first terr. gov. They also constructed more than 100 m. of the Union Pacific railroad, and nearly all of the Utah Central, Utah Northern, and Utah Western roads. The history of U. from 1847 to 1890 is comprised in that of the Mormons (q.v.).

Government.—The constitution, ratified by popular vote 1895, Nov. 5, provides that the right of conscience shall never be infringed; that no public money or property shall be appropriated for the support of any ecclesiastical establishment; that the right of trial by jury shall remain inviolate; that no law shall be passed granting irrevocably any franchise, privilege, or immunity; and that all laws of a general nature shall have uniform operation. Perfect toleration of religious sentiment is guaranteed, and polygamous or plural marriages are forever prohibited. Art. IV. declares that both male and female citizens of the state shall enjoy equally all civil, political, and religious rights and privileges, and that every citizen of the United States of the age of 21 years and upward, who shall have been a citizen for 90 days, and shall have resided in the state or territory one year, in the co. 4 months, and in the precinct 60 days prior to an election, shall be entitled to vote thereat, excepting idiots, insane persons, and unpardoned persons convicted of treason or crime against the elective franchise. The legislative power is vested in a senate and house of representatives with biennial sessions, senators to be elected for 4 years, and representatives for 2 years, and all to be at least 25 years old. Till otherwise provided the senate will consist of 18 members and the house of representatives of 45; but the senators shall never exceed 30 in number, and the representatives shall never be less than twice nor greater than three times the number of senators. The executive department consists of a gov. (salary till otherwise provided $2,000 per annum); sec. of state ($2,000); state auditor ($1,500); state treas. ($1,000); atty.gen. ($1,500); and supt. of public instruction ($1,500), all elected for terms of 4 years. Candidates for the offices of gov. and sec. of state must be at least 30 years of age, and for that of atty.gen., at least 25 years. The gov. is vested with authority to veto objectionable features of a

bill while approving other portions, and in case of his death, impeachment, removal from office, or inability to perform the duties of his office, they devolve upon the sec. of state till the disability ceases or the vacancy is filled by regular election. The gov., justices of the supreme court, and atty.gen. constitute a board of pardons; the gov., state treas., and state auditor, a board of insane asylum commissioners; and the gov., atty.gen., and supt. of public instruction, a board of reform school commissioners. The judicial power is vested in the senate sitting as a court of impeachment, in a supreme court of 3 judges (till 1905 when the number may be increased to 5), in district courts (7 till otherwise provided), in justices of the peace, and such other inferior courts as may be established by law. Judges of the supreme court are elected by the electors of the state at large for terms of 6 years, and the one having the shortest term to serve becomes the chief justice; and judges of the district courts are elected by the electors of their respective districts for terms of 4 years. The constitution locates the public institutions of the state, and confirms to each the lands granted to it by the United States in the act of congress 1894, July 16, as follows: the seat of govt. and the state fair at Salt Lake City; state prison in the co. of Salt Lake; institutions for the deaf and dumb and the blind and the State Reform School at Ogden; and the state insane asylum at Provo City.

The state started on its course with a full republican administration. In 1902 the legislature was composed of 26 democrats and 37 republicans.

The successive govs., with their terms of service, are as follows:

Territorial.

Brigham Young	1850-54	George L. Woods	1870-73
Edwin J. Steptoe	1854-57	Samuel B. Axtel	1873-75
Alfred Cummings	1857-61	George W. Emery	1875-80
Stephen S. Harding	1861-64	Eli H. Murray	1880-86
James D. Doty	1864-65	Caleb W. West	1886-90
Charles Durkee	1865-69	Arthur L. Thomas	1890-93
J. Wilson Shaffer	1870-71	Caleb W. West	1893-96

State.

Heber M. Wells ..1896—

Counties, Cities, and Towns.—In 1890 and 1900 the most populous counties and cities were:

Counties.	1900.	1890.	Counties.	1900.	1890.
Salt Lake	77,725	58,457	Boxelder	10,009	7,642
Utah	32,456	23,416	Davis	7,996	6,469
Cache	18,139	15,509	Summit	9,439	7,733
Weber	25,239	23,005	Sevier	8,451	6,199
Sanpete	16,313	13,146	Juab	10,082	5,582

Cities.	1900.	1890.	Cities.	1900.	1890.
Salt Lake City	53,531	44,483	Mt. Pleasant	2,372	2,254
Ogden	16,313	14,889	Brigham	2,859	2,139
Provo	6,185	5,156	American Fork	.....	.....
Logan	5,451	4,565	Park City	2,732	2,850
Springville	3,422	2,849	Payson	3,759	2,135
Spanish Fork	2,735	2,214	Eureka	2,626	1,733

The territorial census 1895, showed the population by cos. to be as follows: Beaver 3,791; Boxelder 8,331: Cache 18,286; Carbon 3,696; Davis 7,480; Emery 4,390; Garfield 2,888; Grand 891; Iron 3,123; Juab 6,466; Kane 1,908; Millard 5,375; Morgan 2,261; Piute 1,727; Rich 1,781; Salt Lake 68,182; San Juan 500; Sanpete 15,538; Sevier 7,893; Summit 9,631; Tooele 4,428; Uinta 3,967; Utah 29,-229; Wasatch 4,408; Washington 4,619; Wayne 1,520; and Weber 25,015—total, 247,324.

Population.—(1860) 40,273; (1870) 86,786; (1880) 143,963; (1890) 207,905; (1900) 276,749.

UTAH LAKE: body of fresh water in Utah co., Utah, 4,300 ft. above sea-level; area about 130 sq. m. Its waters are discharged at its n. end through the river Jordan (45 m. long) into Great Salt Lake. U. Lake abounds in fish. Its tributaries are Corn creek, Hobble creek, American fork, Spanish fork, and Provo river. It has on the e. the Wahsatch Mts., and on the w. the Oguirrh range, the Lake Mts., and the Tintic Mts.

UTAH, UNIVERSITY OF: co-educational institution at Salt Lake City; organized 1850 under the name of the University of Deseret; name changed as at present 1890. The univ. occupies a square of 10 acres given it by the city 1850 on condition that the main buildings should be erected thereon. In 1895 the city removed this condition, so that the ground may be held if the main buildings are in or contiguous to the city. The year previous the United States govt. granted the univ. a large tract on the Fort Douglas reservation, on condition that it occupy it within five years, and the Literary and Scientific Association of Salt Lake City endowed a professorship with a gift of $60,000. The work of the univ. has been much retarded by lack of funds. In 1901 there were 32 professors and instructors, 684 students, 10,600 vols. in the library, grounds and buildings valued at $450,000, productive funds $244,000, and income $72,902. Pres., J. T. Kingsbury, PH.D.,D. In time the institution will realize a handsome sum from its land grants.

U'TAHS (Indians): see UTES.

UTAS: see UTIS.

UTENSIL, n. *ū-tĕn'sĭl* [L. *utensĭlĭs*, that may be used, fit for use—from *utor*, I use]: that which is used; an instr. or vessel in domestic use, and the like.

UTERINE, a. *ū'tĕr-ĭn* [F. *utérin*—from L. *utĕrīnus*, uterine—from *utĕrus*, the womb: It. *utero:* akin to Skr. *udara*, the belly]: of or pertaining to the uterus, or proceeding from it; born of the same mother but by a different father. U'TERUS, n. *-ŭs*, the muscular and vascular part in the females of mammals, in which conception occurs, and in which the fetus is developed and nourished until birth; the Womb (q.v.). UTERITIS, n. *ū'tĕr-ī'tĭs*, inflammation of the womb. UTERO-GESTATION, *ū'tĕr-ō-*, the period of pregnancy.

UTES, *ūts*, or UTAHS, *ū'tâz:* subdivision of the Shoshone family of American aboriginals. They lead a nomad life—hunting and fishing, and having no agriculture; besides the result of the chase and fishing, their subsistence is on berries, roots and other spontaneous products of the earth. They lead a roaming life or live on reservations in Utah (1711), Cal. (1,000), and N. Mex. (number not determinable). Some of their kinsmen, the *Pah-Utes*, are on reservations in Nev. (596); the *Pi-Utes*, also of Shoshone stock, are in Nev. on reservations (227), in Oregon 80. Aboriginals of these tribes not on reservations are not separately enumerated in the 12th U. S. census reports as far as published.

UTGARD, n. *ŏt'gârd* [Icel., out-yard]: in *Scand. myth.*, a region at the uttermost borders of the habitable world, the abode of giants and monsters; hell.

UTICA, *ū'tĭ-ka:* city, cap. of Oneida co., N. Y.; on the Mohawk river, at junction of the Chenango and Erie canals; and on the Delaware Lackawanna and Western, the New York Central and Hudson River, the New York Ontario and Western, the Rome Watertown and Ogdensburg, and the West Shore railroads; 52 m. e. of Syracuse, 95 m. w.n.w. of Albany; 10 sq. m. It is in the third richest dairy co. in the United States, and for many years has been the principal cheese-market of the country. The city occupies an attractive site that rises gradually from the river, and is supplied with gas and electric light plants, adequate water-works, paid fire dept., street railroads extending to suburban villages, three public parks, and a popular driving-park on the e. boundary. In 1900 the various manufactures had $19,289,502 capital, 10,759 hands, and $19,550,850 in value of products. In 1890 the chief industries according to value of products were: men's clothing, $2 833,308; cotton goods, $2,160,247; boots and shoes, $851,300; foundry and machine-shop products, $771,616; hosiery and knit goods, $715,178; and printing and publishing, $513,940. The manufactures now include woolen, cotton, and knit goods; stoves; steam-engines; agricultural implements; farm-wagons; locomotive-lamps; millstones; furniture; organs; stoneware; drain-pipe,

fire-brick; carpet, and oil-cloth. In 1902, Jan., the net public debt was $585,291; assessed prop. valuation $32,-922,276; personal $5,493,752; tax rate $1.71 on $100. There were 3 daily, 1 tri-weekly, 1 semi-weekly, 6 weekly, 4 monthly, and 1 quarterly publications. In 1902, Sep., there were 4 nat. banks (cap. $2,100,000), 2 state banks (cap. $325,000), and 1 savings bank (surp. $1,103,722). The public and notable buildings included the city hall, pub. library, opera house, 5 hospitals, 4 orphan asylums, 2 homes for the aged, home for women, Utica Female Acad., a public dispensary, and the State Lunatic Asyl. There were 47 churches—viz., Rom. Cath. 6; Prot. Episc. 7; Presb. 6; Meth. Episc. 5; Bapt. 4; Welsh 3; Ger-Evang. Luth. 5; Eng. Evang. Luth. 2; Ger. Moravian 2; Hebrew 2; and Congl., Ref., and Univ. each 2; and 22 public and 14 private and denominational schools.—The site of the city was included in a grant made by George II. 1734. Fort Schuyler was erected on the s. bank of the Mohawk river at the fording place 1758; several log-cabins were built in the vicinity 1788, and a store and road-house 1790; the place was incorporated as a village 1798; and a city charter was granted 1832.—Pop. (1880) 33,914; (1901) 56,383.

UTICA, *ū'tĭ-ka:* ancient city of n. Africa; seat of a Phœnician colony, founded B.C. 1101; about 20 m. n.w. of Carthage, not far from the present city of Tunis. Extensive remains are still found on a hill 8 or 10 m. inland, but anc. U. stood on the coast. During the third Punic war, U. submitted to Rome, and became the seat of a Roman governor. It was afterward the see of a Christian bishop. Here Cato the Younger (q.v.) died.

UTILITARIANISM: theory of Ethics, or of the science of moral obligation, that makes the happiness of mankind the criterion of right. The word 'Utility' was used in this sense by Jeremy Bentham; the form 'Utilitarianism' by John Stuart Mill.

The doctrine of U. is opposed to all those theories that refer us to some internal sense, feeling, or sentiment, for the test of right and wrong; a test usually described by such phrases as a Moral Sense, and Innate Moral Distinctions (see ETHICS); therefore Utility is sometimes termed the *external* or objective standard of morality. It is opposed also to the view that founds moral distinctions on the mere arbitrary will of God.

The Utilitarian theory has been maintained in ancient and in modern times, though with considerable variation, not merely in the mode of stating it, but in important peculiarities. Thus, in ancient times it was held by Epicurus, but in a purely self-regarding form; each person's end was his own happiness exclusively, the happiness of others being instrumental and subordinate. The modern phase of the theory may be said to begin with Hume. He employed, as the leading term of his system, not Utility, but Benevolence; whereby he gave especial prominence to the disinterested side of moral actions. He strenuously maintained, what must be regarded as the essential feature of the Utilitarian doctrine, that no conduct is to be deemed worthy of moral approbation unless, in some way or other, it promotes human happiness; and that actions ought to be visited with disapprobation exactly according as they have the opposite tendency.

Jeremy Bentham is, more than any other person, identified with the theory of 'Utility,' which was in his hands not merely the foundation of Ethics, but also the basis and justification of political and legal reforms. Having in view the state necessity of sacrificing smaller interests to greater, or, at all events of not sacrificing greater interests to smaller, he described the ethical end as 'the greatest happiness of the greatest number.' He illustrated the doctrine by setting it in opposition to *asceticism*, which he interpreted to mean that pleasure is forfeited, and pain incurred, without yielding a compensating amount of good, either to the agent or to other persons.

Paley advocated a form of U.: he made the will of the Deity, enforced by future rewards and punishments, the impelling motive to duty; but in determining what that will was, in particular cases, he included a reference to the beneficial tendency of actions.

James Mill maintained substantially the views of Bentham. Sir James Mackintosh, while differing in some points from Bentham and from Mill, in the main adhered to Utility as the ultimate standard of right. John Austin, in his *Province of Jurisprudence Determined*, contributed a lucid exposition and a powerful defense of the principle. John Stuart Mill devoted a separate work to the subject. Samuel Bailey, in *Letters on the Human Mind*, III., discussed the ethical problem fully, and pronounced on the

Utilitarian side. Herbert Spencer ranks among the upholders of U.; likewise Bain, in his edition of Paley (Chambers's series) and in *The Emotions and the Will.*

Before stating the arguments for and against the principle of Utility as the basis of morals, it is proper to inquire what sort of proof an ethical system is susceptible of. Ethics is a practical science (see SCIENCES), and, as such, involves an end; having the peculiarity of being the final or comprehensive end of all human conduct: see TELEOLOGY. Now, in the speculative or theoretical sciences, *ultimate* principles cannot be proved; it is the nature of proof to rest one doctrine on some other doctrine, so that we must come at last to what is taken without proof: we cannot prove our present sensations, nor can we demonstrate that what has been will be; we must take these things for granted. And so it is with ultimate ends in the practical sciences: we cannot prove that each person should seek his own happiness; we must assume it as an ultimate fact, and trace the consequences. The final end sought in all conduct cannot be reasoned; it must be gathered from the actual conduct of men; we must find by observation what ends men actually pursue, and, if we can, generalize them into one comprehensive statement. The function of argument in the case is to show where inconsistency has crept in, or to make professions accord with practice. Thus it is that the supporters of U. aver that men, even though refusing the theory, still proceed on it in their conduct; and that the doctrine cannot be impugned consistently with the admitted motives of human action. Human beings, as a rule, have no other end in life but happiness, either for themselves or for others; and morality belies human nature if it does not accord with this universal object of pursuit.

Although Utilitarians hold that good and evil, right and wrong, are properly determined by a calculation of the consequences as regards human happiness, they do not all maintain that past or existing systems of morals have been on all points framed on this principle. Bentham and James Mill appear to have thought that the rule has always been kept in view, though often badly applied. But others, equally earnest in regarding it as the only legitimate rule, are of opinion that, in the past and existing ethical precepts, men have been guided partly by Utility, partly by Sentiment—i.e., liking or disliking for the act itself, irrespective of any further consequences. Thus, the veneration of the Hindu for the cow, on which ethical duties are founded, is an instance of sentimental liking; the Jewish and Mohammedan prohibition of the pig is a matter of sentimental dislike. In the ceremonial rites of ablution, so widely prevalent, there is a certain show of Utility, mingled with the fancy of cleanliness or purity. In the doctrine of the sacredness of kings there is a combination of Utility and Sentiment.

The following are the chief objections to U., with the arguments in reply:

I. It is maintained that Happiness is not, either in fact

or in right, the sole aim of human pursuit; that men actually, deliberately, and by conscientious preference, seek other ends. Thus, virtue is an end in itself, to be sought whether it yield happiness or not, and even though it were productive of the greatest misery. The qualification, however, is always added, that virtue, in the long run, without intending it, and all the more for not intending it, is the unfailing source of happiness.

To which the supporter of U. answers:

1. It is quite true that men seek other ends than immediate happiness to themselves and to others, and that, in particular, they cultivate the virtues as ends in themselves, without always thinking of them as means to happiness. But this is by the operation of a familiar law of the mind, whereby what was originally of the nature of means comes at length to be valued as an end; such is the well-known case of the love of money. The virtues of justice and veracity are essential to human society, just as money represents the basis of subsistence; and, by frequent association, the regard that we pay to the end is transferred at last to the means.

2. It may be shown in many ways that the great social virtues derive their worth in our estimation from their subservience to human happiness, and not by any absolute title of their own. Take, first, Veracity or Truth, which, of all the moral duties, has most the appearance of being an absolute and independent requirement. A little consideration will show that even this is not in our eyes an unlimited or unqualified virtue. Men have always approved of deception practiced toward an enemy in war, to a madman, or a highway robber; also, secrecy or concealment, even though misinterpreted by others, is generally allowed—unless it leads to some pernicious results; while if the divulgence of the truth were attended with harm, it would be generally reprobated. But an absolute standard of truth is incompatible even with secrecy or disguise; in departing from the course of perfect openness, or absolute publicity of thought and action, in every possible circumstance, we renounce ideal truth in favor of a compromised, qualified veracity—a following of truth only so far as is expedient.

Again, as regards Justice, the presence of considerations of Utility is equally obvious. There is no absolute rule of justice that does not bend to circumstances. If justice be defined giving every one his own, or what he is entitled to, there is the show of an absolute rule; but, in reality, nothing is determined. The meaning is, to give to each what *law* and *custom* have declared to be a man's own. It is declared just for an elder son to receive a larger share of the parental estate than all the rest of the children put together; but it is clear that whatever justice there is in this must be founded on some ground of expediency. (See, on this subject, J. S. Mill's *Utilitarianism*, chap. v.)

II. It is further objected to the adoption of Utility as the standard of Right that the full consequences of actions are too numerous, involved, and complicated to be reduced

to calculation; and that, even where the calculation is possible, people have seldom time to make it.

To this it is answered, first, that the primary moral duties refer to conduct that can be fully calculated to the satisfaction of any reasoning mind. Thus, to revert to the two leading examples, Truth and Justice: the habitual disregard of these duties would soon bring a society to utter confusion and ruin; without them there could be no social co-operation; man would fall below the condition of the gregarious animals; the race could hardly be saved from extirpation. On the other hand, the observance of these duties in a high degree raises to a corresponding degree the means of human happiness. The balance of advantages is all on one side—there is no case for the other side at all.

There have always been moral rules or enactments where the calculation of consequences was much less easy—e.g., the indissolubility of marriage is maintained in some countries, and not in others; and there have been considerable differences as to the forbidden degrees of affinity in marriage. In these usages there are both advantages and disadvantages, and the preponderance is variously estimated by different calculators. In such cases the Utilitarian would say: Do not make a compulsory enactment restricting liberty, which restriction is an evil in itself, unless the balance of advantages is unquestionable and great.

As to the argument that it is impossible to make the calculation of consequences at every time of our performing a moral act, the reply is, this is unnecessary; the calculations as to the various duties have been already made, and are embodied in rules, which rules we remember and apply without thinking of the process through which they are reached. The navigator at sea does not need to compute the *Nautical Almanac* every time he determines his longitude; he carries it to sea with him ready for use.

III. A third objection to U. is, that men in all ages have distinguished between the Right, on one hand, and the Expedient, i.e., the Useful, on the other: the two are in most languages put in opposition or contrast. The reply is, that the Expedient, when thus opposed to the Right, commonly means what seems expedient for the agent at the time, but is not expedient for people generally, or even for himself in the long run. It is sometimes expedient, in this sense, to tell a lie, to rob, or to murder; but such actions are not expedient in the sense of general utility or the greatest happiness of mankind, nor in the sense of the greatest happiness of the individual.

It is further to be remarked, in this contrast of the Expedient and the Right, that the Expedient may mean simply an addition to our conveniences or comforts, something that it is well for us to have, but that we might do without. Thus, it is highly expedient to possess cheap postage, railways, and electric telegraphs. On the other hand, the Right points to the essentials of our existence; without the fulfilment of contracts, respect to life and property, obedience to law, society would be dissolved.

The distinction was expressed in one of Cromwell's speeches, by the contrast of a nation's Being and its Well-being; what secures the one is emphatically the Right, the promotion of the other is the Expedient. Right is the highest and most imperative form of Expediency.

IV. A fourth objection against U. is, that all useful things are not made obligatory; it may be useful to have railways, but it is not a duty of every man to make them. But the Utilitarian, while contending that nothing should be made a moral duty but what contributes to the happiness of mankind, does not hold the converse, that whatever promotes human welfare is a moral duty. Perhaps this response presents the point most open to question on the Utilitarian side.

So much for the objections. The positive ground of U. is, that men actually recognize happiness as their paramount consideration or highest end. This, as a general rule, is too obvious to require proof. Each one's plan of life is principally made up of ideas of happiness to self or to others. All our good wishes to one another are repetitions of the one idea, 'May you be happy.' The seeming exceptions have been noticed above. The objector, however, might answer that the mere fact that a certain line of action is common among men is not a proof that that line supplies the chief or even the true ethical standard.

One of the confirmations of U. which is often appealed to is derived from the usual inducements to right conduct common to all moralists. We find that no one can preach morality without making use of its bearings on happiness. The very meaning of the terms expressive of the highest virtues—love, goodness, mercy, compassion, fidelity, honesty, integrity, justice—is something that relieves the pains and augments the pleasures of sentient beings. To love is to make the object happier, and love is the fulfilling of the law. This argument states an undeniable truth; but in the form thus given it seems to show that happiness depends on doing right—not the form of statement special to U., which is that doing right depends on happiness.

Although there be duties occasionally imposed on men that have no obvious tendency to increase happiness, but rather to diminish it, as the labors of some cumbrous ceremonial system like Hinduism, those duties have to be upheld by the fear of punishment or the hope of reward, still testifying to the predominating motives of the human mind. It is not, however, by reference to traditional observances that the happiness motive is most clearly tested. The proper plan, as remarked by Samuel Bailey, is to try it upon some fresh case, some entirely new enactment, when it will be found that the interest or happiness of the community is the *sole* consideration appealed to. If a new law of inheritance is proposed, or a new government board constituted, nobody advances any other criterion but expediency, or the good of certain persons now or in the future; unless such expediency can be shown, no one will move in the matter at all; and the earnestness

of the promoters will be in exact proportion to their sense of the resulting good. If U. be claimed as the standard for legal enactments, this proof may suffice.

Probably in this debate, as in many others in philosophy, each side has one side of the great truth, to whose adequate statement both sides must contribute. Doing right and happiness are essentially and ultimately inseparable: it is vain to try to consider them as in any large sense disconnected from each other.

It is to be noted, however, that U. is considered in this article not as a theory of the *ultimate ground* or reason of man's moral obligation to right or duty, but as a theory of the practical test or criterion by whose application right or duty is to be judged and decided. These two spheres of the theory, though connected, are distinct; and the former deals with the profoundest questions.

UTILITY, n. *ū-tĭl'ĭ-tĭ* [F. *utilité*—from L. *utilĭtas* or *utilĭtātem*, utility, benefit—from *utilis*, useful—from *utor*, I use: F. and It. *utile*, useful]: usefulness; profitableness; benefit; advantage; profit. UTILIZE, v. *ū'tĭl-īz*, to render profitable; to turn to good account or use. U'TILIZING, imp. *-ī-zĭng*. U'TILIZED, pp. *-īzd*. U'TILIZA'TION, n. *-ĭ-zā'shŭn*, the act of turning to account or of making profitable. U'TILITA'RIAN, a. *-ĭ-tā'rĭ-ăn*, pertaining to utility or things useful; considering utility rather than beauty; regarding usefulness only; pertaining to utilitarianism: N. one who holds the doctrine of utilitarianism U'TILITA'RIANISM, n. *-ĭzm*, the doctrine which makes utility the sole standard of good for man, or of moral conduct; the doctrine that 'the greatest happiness of the greatest number' should be the end and aim of society in its social and political institutions.—SYN. of 'utility': service; use; avail; usefulness; advantageousness; convenience.

UTIS, n. *ū'tĭs*, or UTAS, n. *ū'tăs* [F. *huit*, eight—from L. *octo*, eight]: in *OE.*, the octave; the eighth day, or the space of eight days, after a saint's day; a saint's day or festival.

UTLATE'CAS: see QUICHES.

UTMOST, a. *ŭt'mōst* [AS. *utemest*—from *ut*, out; *mæst*, most]: at the furthest point or extremity; most distant; last; extreme; of the greatest or highest degree: N. the most that can be; the greatest power, degree, or effort.

UTOPIA, *ū-tō'pĭ-a* [Gr. *ou*, not; *topos*, place—therefore literally 'nowhere']: the imaginary island which Sir Thomas More (q.v.) makes the scene of his famous political romance, *De Optimo Reipublicæ Statu, deque Nova Insula Utopia*, pub. in Lat., Louvain 1516, transl. into Eng. by Bp. Burnet. This island, which More represents as discovered by a companion of Amerigo Vespucci, is the abode of a happy society, which, in virtue of its wise organization and legislation, is free from the harassing cares, inordinate desires, and customary miseries of mankind. More's romance obtained wide popularity, and the epithet *Utopian* has since been applied to visionary or impracticable schemes for improvement of society.

UTOPIAN, a. *ū-tō'pĭ-ăn* [from More's *Utopia* (lit., *no place*), an imaginary land which he represents as enjoying the utmost perfection in its laws and institutions, etc.—coined from Gr. *ou*, not; *topos*, a place]: pertaining to any state of ideal perfection; fanciful; chimerical; impracticable: N. one who is enthusiastic in the advocacy of impracticable schemes. UTO'PIANISM, n. *-ĭzm*, the tendencies of a utopian; chimerical schemes in theory or practice.

UTRAQUIST, n. *ū'tra-kwĭst* [from L. *utraquistæ*—from *utrâque* (sc., *specie* in both kinds)]: one who believes that communicants should partake of both the cup and the bread: applied first in the 14th c. to all those members of the Western Church, principally followers of John Huss (q.v.), who contended for administration of the Eucharist to the laity in both kinds; but in later times restricted to one particular section of the Hussites, the Calixtines (q.v.), though all Hussites claimed this as a fundamental principle of their church discipline. The name may be said to date from 1415, when the followers of John Huss in Prague and elsewhere in Bohemia adopted 'the communion of the cup' as their rallying cry, and emblazoned the cup on their standards as the distinguishing badge of the association. In 1417 the Univ. of Prague, by a formal decision, directed that the laity should communicate in both kinds; the result being that the Council of Constance prohibited students from resorting to Prague for study. The Hussite party, on the contrary, made the demand one of the four points on which they insisted as the condition of their submission to the church. It was rejected by the Council of Constance; but the Council of Basel, 1433, acceded to it on the condition that, whenever communion was administered with the cup to the laity, the ministering priest should accompany the ministration with a declaration that Christ was contained whole and entire under each species. A portion of the Hussite party was content with the explanation of this and the other points offered by the council, but the more strenuous held out: see HUSS, JOHN. Those who yielded were called Utraquists. During the Reformation troubles this division was still maintained. The Utraquists were favorably regarded by the imperial party; and after the battle of Mühlberg, 1547, they alone were formally tolerated in Bohemia and Moravia. One of the most celebrated leaders was Jacobus v. Mies. *Note.*—The name U. is applied also to certain districts or villages in Bohemia and Moravia, in which *both languages*, i.e., Bohemian and German, are spoken.

UTRECHT, *ū'trĕkt*, Dut. *ü'trĕcht:* prov. of the Netherlands; bounded w. by S. Holland, n. by N. Holland and the Zuider Zee, e. by Gelderland, s. by the Rhine and Leck; 42 m. long from e. to w., and 21 wide from n. to s.; 346,405 acres, of which 62,500 are arable, 180,000 under grass, 39,000 in wood.

The country is varied by beautiful hilly districts, level fields, orchards, tilled land, meadows, and moss. The hilly tract is well wooded, and stretches from near Amersfórt to

Rhenen on the Rhine, 21 m. Rye, oats, and buckwheat are grown; sheep, cattle, and bees extensively kept. S. of this belt is rich clay land, producing excellent wheat and barley. Near Amersfórt and Rhenen, tobacco is largely planted.

U. is watered by the Rhine, Vecht, Leck, Amstel, Grebbe, and many other rivers. Many herrings, eels, flounders, anchovies, etc., are taken in the Zuider Zee. Besides agriculture, the industries are soap-boiling, sawing wood, copper and iron founding, making machinery, carpets, tiles, bricks, coarse pottery, cement, etc. There are many beautiful country-seats, the climate being dry and healthful.

The chief places are Utrecht (q.v.), Amersfórt (q.v.), Rhenen, Wijk bij Duurstede, Montfórt, and Ijsselstein (pronounced *ī'sél-stīn*). There are 66 country parishes.—Pop. (1886) 212,454, of which 62 per cent. Prot., 37 per cent. Rom. Cath., and 1 per cent. Jews; (1901) 259,834.

UTRECHT (*Ultrajectum* or *Trajectum ad Rhenum*): town of Holland, cap. of the prov. of U.; 24 m. s.e. of Amsterdam, beautifully situated in a district abounding in sand-hills, woody heaths, rich grassy meadows, extensive orchards, flower-gardens, and cultivated fields. The old walls were levelled 1830, planted with trees, and formed into beautiful and well-kept promenades; but U. is now surrounded with strong forts, and is strategically important as covering Amsterdam.

U. is favorably situated for trade, being the point from which several railways radiate: it is traversed by two canals, and has excellent water-communication by the Old Rhine and the Vecht. The staples are grain, cattle, and various manufactures. It is the residence of many noble families, the seat of a univ., national veterinary school, national hospital, high military court, etc. Principal buildings are the cathedral or Domkerk, the town-house, the mint, the univ., and several handsome barracks for the infantry and cavalry, especially the Willemskazerne. The cathedral was consecrated to St. Martin about 720. In 1674 a hurricane destroyed the body of the building between the choir and the tower, so that the latter (321 ft. high) is now isolated. The Univ. of U., founded 1636, has 41 professors and about 600 students. It has a fine library of 150,000 vols., museum of nat. history, botanic garden, and observatory. There is a national school for milit. surgeons; a grammar school; normal school; musical college; historical, meteorological, medical, pharmaceutical, and other societies. Since 1723 U. has been the headquarters of the Jansenist Church (q.v.).

The charitable institutions are numerous. Principal industries are: manufacturing tobacco and cigars; woolen fabrics and carpets; ultramarine and bone-black; salt; furniture; baskets; tin, copper, and silver work; sawing wood; rope-making; iron-founding; book-printing; etc. The royal cigar factory alone makes 40,000 cigars daily.

U. is one of the oldest cities of the Netherlands, founded (probably) by the Romans. Here the famed union of the northern provinces for defense of political and religious

freedom was formed 1579, Jan. 23. For a short time in 1807, Louis Napoleon, King of Holland, resided in U. It has been the birthplace of many distinguished men, among others Pope Adrian VI. 1459.—U. has acquired celebrity for the number of treaties signed there in bringing to an end the war of the Spanish Succession: see UTRECHT, PEACE OF: SUCCESSION WARS.

Pop. (1876) 66,106; (1887) 79,166; (1901) 106,800.

U'TRECHT: town in the extreme s. of the South African Republic, on the frontier of Natal, the Buffalo river here marking the boundary. It is a place of considerable importance and the cap. of a district.—Pop. about 3,500.

U'TRECHT, PEACE OF: the peace concluded at Utrecht (q.v.) 1713, Apr. 11, bringing to an end the war of the Spanish Succession (see SUCCESSION WARS). Preliminaries between France and Great Britain had been signed in London 1711, Oct. 8. A peace-congress was opened at Utrecht 1712, Jan. 12; but the preposterous demands of Austria forced the French to break off the conferences, in the hope of making a separate peace with Britain and compelling the other allies to lower their pretensions. This plan was successful: agreement on all points at issue was established between France and Great Britain 1712, Aug.; and soon afterward agreements were made with Holland, Portugal, Prussia, and Savoy. As each of the contracting parties negotiated in its own name, nine distinct treaties of peace were signed 1713, Apr. 11. By the treaty between France and Great Britain, France ceded St. Kitt's, Hudson's Bay, Nova Scotia, and Newfoundland (liberty of fishing for cod being reserved), formally recognized the reigning dynasty and the Hanoverian succession, agreed to demolish the fortifications of Dunkirk, engaged that the crowns of France and Spain should never be united, and that no part of the Spanish Netherlands should ever be ceded or transferred to France. Spain renounced her Italian possessions in favor of Austria, and gave up Gibraltar and Minorca to Great Gritain, with which power also she concluded the *Assiento* (q.v.) treaty. The chief of the special agreements with the other contracting parties were as follows: Ypres, Knocke, etc., to be exchanged with Holland for Douai, Bouchain, etc., and a treaty of commerce to be concluded; both banks of the Amazon to belong to Portugal; Spanish Gelders and the dist. of Kessel to be ceded to Prussia, and its ruler's title of king, assumed 1701, formally recognized—Prussia in turn resigning all claims to the principality of Orange; the Duke of Savoy to obtain Sicily, with title of king, etc. The treaty of U. did not make peace with Austria and the German empire; but in the following year, at Rastadt (1714, Mar. 17) and Baden (1714, Sep. 18), they agreed to substantially the same terms as were offered at U. The electors of Cologne and Bavaria, who had been put under the ban of the empire, were restored; Sardinia, granted to Bavaria at U., was restored to Austria; Austria renounced her claims to the Spanish succession; the cession of the Spanish possessions in Italy was confirmed; Breisach and Freiburg, in the Breisgau, were given to Austria; the

highest ridge of the Maritime Alps was made the boundary between France and Savoy; and on failure of the Spanish Bourbons, the crown of Spain was to fall to the House of Savoy.—See Lord Mahon's *History of the War of Succession in Spain* (Lond. 1832).

UTRERA, *ô-trā'râ:* old town of Spain, prov. of Seville, 18 m. by railway s.e. of Seville. In early times, it was flourishing and populous; and in recent years it has begun to revive. It is important as a military post; contains a beautiful Gothic church, a Moorish castle, and cavalry barracks. The streets and promenades are kept clean and fresh by streams of running water. The inhabitants are mostly agriculturists engaged on the productive estates which surround the town. Grain, wine, oil, and fruit are produced. Sheep and cattle are reared in the vicinity. —Pop. 15,093.

UTRICLE, n. *ū'trĭ-kl* [L. *utricŭlus*, a small skin or leathern bottle—from *uter*, a bag or bottle made of an animal's hide]: in *bot.*, a thin-walled cell; a bladder-like covering; a thin-skinned one-seeded fruit. UTRICULAR, a. *ū-trĭk ū-lêr*, containing vessels like small bags. UTRIC'ULATE, a. *-lāt*, utricular. UTRIC'ULUS, n. *-lŭs*, a kind of fruit with an inflated covering; a little bladder filled with air, attached to certain aquatic plants.

UTRICULA'RIA: see BLADDERWORT.

UTTER, a. *ŭt'têr* [AS. *ut*, out; *utor*, outer, extreme]: complete; perfect; total; absolute; thorough; entire; in *OE.*, situated on the outside or remote from the centre; outer: V. to send *out*, as words; to speak; to disclose; to publish; to put into circulation, as base coin; to dispose of. UT'TERING, imp. UT'TERED, pp. *-têrd.* UT'TERABLE, a. *-ă-bl*, that may be uttered; that may be spoken or expressed in words. UT'TERANCE, n. *-ăns*, manner of speaking; pronunciation; a putting into circulation, as base coin. UT'TERER, n. *-êr*, one who utters; a promulgator. UT'TERLY, ad. *-lĭ*, to the full extent; perfectly; totally. UT'TERMOST, a. *-mōst*, extreme; in the furthest or highest degree: N. the greatest power or degree; that beyond which nothing is. UTTER BARRISTER, one admitted but not yet allowed to plead within the bar. TO THE UTTERMOST, in the highest degree.—SYN. of 'utter, v.': to deliver; give forth; discharge; pronounce; liberate; discover; sell; vend; declare; express;—of 'utter, a.': extreme; excessive; utmost; peremptory; perfect; mere.

UTTERANCE: see under UTTER.

UTTERANCE, n. *ŭt'têr-ăns* [F. *outrance*, excess—from *outre*, beyond—from L. *ultra*, beyond]: in *OE.*, extremity; terms of extreme hostility.

UTTOXETER, *ŭt-tŏks'ê-têr*, locally, *ŭks'ê-têr:* market-town of Staffordshire England: on an eminence above the vale of the Dove, 16 m. n.e. of Stafford. A church with an ancient tower and lofty spire is noteworthy. There are two large breweries.—Pop. about 4,000.

UVEA, n. *ū'vĕ-ă* [L. *uva*, a grape]: in *anat.*, the posterior layer of the iris, so called from the black pigment which covers it, and which resembles the skin of a black grape. U'VEOUS, a. *-ŭs*, resembling a grape; of or pertaining to the uvea. U VIC, a. *-vĭk*, of or from the grape.

UVULA, n. *ū'vū-lă* [L *uva*, a grape: It. *uvola*]: in *anat.*, the fleshy conical body suspended from the middle of the lower border of the soft Palate (q.v.). U'VULAR, a. *-lĕr*, of or pertaining to the uvula.

UXBRIDGE, *ŭks'brĭj:* market-town in the county of Middlesex, England; on the Colne, 15 m. w. of London. Its corn-market is one of the most important in the kingdom, and it has several breweries, and flour-mills, an iron-foundry, and considerable trade in lumber.—Pop. (1881) 7,712; (1891) 8,206.

UXORIOUS, a. *ŭg-zō'rĭ-ŭs* [L. *uxōrius*, of or pertaining to a wife—from *uxor*, a wife]: foolishly fond of a wife. UXO'RIOUSLY, ad. *-lĭ*. · UXO'RIOUSNESS, n. *-nĕs*, excessive and foolish fondness for a wife. UXOR'ICIDE, n. *-ŏr'ĭ-sīd* [L. *cædo*, I kill]: one who murders his wife; the murder of a wife by her husband.

UYÜK: see EUYUK.

UZBEKS, *ŭz'bĕks:* important branch of the Turkish family of Tartars, constituting the chief element in the native population in Khiva, Bokhara, and Khokand (Ferghana). Some are still nomads, but most are settled in towns: see USBEGS.

V

V, v, *vē:* 22d letter (and 17th consonant) of the Eng. alphabet; *u* and *v* were formerly used indiscriminately the one for the other, but now *u* is used only as a vowel, and *v* only as a consonant. The name of the letter is from the Phœnician and Hebrew *vau* (signifying a nail, which the original form of the letter resembled), which stood sixth in the alphabet, and became the Digamma (q.v.) of the Old Greek, and the *f* of the the Latin (see F). The Greek *υ* (see ALPHABET), from which the Lat. *v* is taken, had, in the classical period, degenerated into a sound like the French *u*, and in modern Greek is undistinguishable from *i*. The Greeks, after they had lost the digamma, represented Lat. *v* by *ου* or *β*; e.g., *Ουαρρων* or *Βαρρων* = Varro, *Βιργιλίος* = Virgilius. In the beginning of Latin words, *v* must have had a consonantal sound approaching that of *v* in English, as is inferred from its persistence as compared with the Greek digamma; e.g., Vinum = (Ϝ)*οἶνος*, Vesta = *Ἑστία*. Between two vowels, on the contrary, it was often dropped out, as in *nuper* for *novumper*, *Jupiter* for *Jovipiter*, *prudens* for *providens;* from which we may conclude that it had in that position the power of a semivowel, like Eng. *w*. In New High German, *v* takes the place of Gothic and Eng. *f* (see F), and is pronounced like *f*, while the *v*-sound is expressed by *w*. —As a Roman numeral, V stands for 5, and with a dash over it ($\overline{V}$) for 5,000.—In *chem.* it is the symbol for *Vanadium.* —As an abbreviation, v. stands for *verb* or *verse;* and in legal papers for *versus*, 'against.'

VA, v. *vâ* [It.]: in *mus.*, go on—e.g., *va crescendo*, go on increasing the power.

VAAL, *vâl*, RIVER: important branch of the Gariep (q.v.) or Orange river, s. Africa. It receives its name (signifying 'Yellow') from the color of its waters when in flood. Ky Gariep, its Hottentot name, has the same meaning. The Bechuanas (see BETJUANS) call it Namagari. The V. rises in the Drakenberg range, at the n.w. angle of Natal, and after a very circuitous course of about 450 m., partly through the S. African Republic (q.v.), but mainly along its s. frontier, joins the other great branch, the Nu Gariep or Orange river, in lat. 29° 10′ s., long. 24° 28′ e.

VACANT, a. *vā'kănt* [F. *vacant*—from L. *vacans* or *vacan'tem*, empty; *vacārĕ*, to be empty: It. *vacante*]: empty; void of every substance except air; not filled by an occupant or possessor; unsupplied; idle; free; indicating want of thought, as a face; inane. VA'CANTLY, ad. *-lĭ.* VA'CANCE, n. *-kăns*, in *Scot.*, vacation. VA'CANCY, n.

-kăn-sĭ, that which is vacant; empty space; time of leisure; situation or office unfilled; the time during which a place or situation remains unfilled; the state of being unfilled; listlessness; emptiness of thought. VACATE, v. *vă-kāt'* [L. *vacātus*, pp. of *vacārĕ*, to be empty, to be without]: to make empty; to withdraw from; to annul. VACA'TING, imp. VACA'TED, pp. VACA'TION, n. *-shŭn* [F.—L.]: act of vacating or making void; the intermission of judicial proceedings; the period during which court does not sit; recess (the 'long vacation' in Eng. courts is Aug. 10—Oct. 24): interruption for a time of regular studies at a college or school; intermission of any stated employment.—SYN. of 'vacancy': vacuity; chasm; relaxation; intermission;—of 'vacant': devoid; free; unencumbered; uncrowded; unfilled; disengaged; thoughtless.

VACCINA'TION: process by which a specific disease, termed *Vaccinia* (q v.) or cow-pox is introduced into the human organism for protection against a far more severe disorder—smallpox. For the history of the remarkable discovery of V.—'that masterpiece of medical induction'—see the life of Jenner (q.v.). In his *Inquiry into the Causes and Effects of the Variolæ Vaccinæ* (1798), he establishes the following facts: (1.) That this disease (cow-pox) casually communicated to man has the power of rendering him unsusceptible of smallpox; (2) that the specific cow-pox alone, and not other eruptions affecting the cow, which might be confounded with it, has this protective power; (3.) that the cow-pox might be communicated at will from the cow to man by the hand of the surgeon, whenever the requisite opportunity existed; (4.) that the cow-pox once ingrafted on the human subject, might be continued from individual to individual by successive transmissions, conferring on each the same immunity from smallpox as was received by the one first infected from the cow.

The *method of vaccinating* and the *phenomena of cow-pox*, as observed in the human subject after V., claim our first and chief attention. Except under circumstances of special risk (e.g., where smallpox is in the neighborhood), children should be vaccinated only when in apparently good health. Diarrhea and skin-diseases are especially to be avoided; and it is important to see that there is no chafing behind the ears, or in the folds of the neck or groin. V. should be in very early infancy, if health permits; healthy children in large towns, when a month or six weeks old; more delicate children, at the age of two or three months; and all except those whose health positively contra-indicates V., by the age of three months.

The lymph to be used should always be taken from a healthy child and from thoroughly characteristic vesicles; and when lymph perfectly satisfactory cannot be procured, V. should be postponed. Lymph is usually taken when the vesicle is fully formed, generally about a week after V.; if not taken till the areola (below described) is complete, its protective power is far less certain. Prime lymph, according to a high authority, has always a certain viscidity; and a thin serous lymph, even from a vesicle

which is not advanced, is to be avoided. Babies are much better lymph-givers than older children or adults; and children of dark complexion, not too florid, with thick, smooth, clear skin, yield the most effective lymph. Lymph should always, if practicable, be passed direct from arm to arm; and preserved lymph should be used only when that from a vaccinated child cannot be obtained. A good vesicle freely punctured on its surface exudes enough lymph or vaccine matter for the direct vaccination of five or six children, and for charging six or eight ivory points for future emergencies. The process of V. consists essentially in introducing the lymph into the structure of the true skin, or in bringing it in contact with the absorbing surface. This may be effected in various ways, one of the most common being by puncture. The operation is extremely simple. The skin on the outside of the arm, below the shoulder (sometimes in adults on the leg, above the knee), should be held on the stretch, and a very sharp, clean lancet, well charged with lymph, should be made to puncture the skin from above downward, at an angle of about 45°, and be made just to enter the true skin: the matter thus inserted is retained by the valvular character of the puncture and the elasticity of the skin. In this form of the operation, not less than five or six such punctures should be made, half an inch from one another; or, for greater certainty, three punctures may be made on each arm. If the lymph is preserved on 'points,' each point, after being held in the steam of hot water to dissolve the lymph, should be inserted into the punctures made by an ordinary lancet. Some surgeons make a number of minute superficial punctures over a patch of the size of a silver half-dime, and spread the lymph over this spot with the flat part of the lancet: this kind of tattooing should be repeated on three spots. Others make a number of parallel scratches, or crossed scratches, with a charged lancet; and others use special scarifiers or rakes, consisting of three or four needle-points inserted in an ivory handle, and drawn either once or twice at right angles over the tense skin, the lymph being then plastered over the scarified surface: this last plan of cross-scratches is favored by some high authorities. A far better plan of preserving lymph than that of drying it on points is that of preserving it in a fluid state in closed capillary tubes, in which form it is ready for use without any preparation. When the operation is successfully performed, the skin at the spot becomes slightly elevated, hard, and red, on the 3d or 4th day; on the 5th or 6th day, a vesicle of bluish-white color forms, with elevated edge and a depressed cup. It is distended with clear lymph, and attains its perfection on the 8th day; and then, or on the 9th day, the vesicle is surrounded by an inflamed ring or areola; on the 9th, 10th, and 11th days, the vesicle becomes a pustule, the cupped form disappears, the areola enlarges till it becomes a circle, with diameter of one to three inches. On the 12th, 13th, and 14th days, the pustule dries up; and in the course of the next week the scab separates and falls off, seldom remaining till the

25th day. It leaves a cicatrix, which usually is permanent in after-life, circular, somewhat depressed, dotted or indented with minute pits, and in some instances radiated. The establishment of the areola is accompanied with constitutional disturbances, as indicated by restlessness and heat of skin, frequent derangement of the stomach and bowels, and occasional swelling of the glands of the armpit. These symptoms are seldom severe, but seldom quite absent. Occasionally the course of the above symptoms is modified, as when they are simply retarded, or simply accelerated, or altogether irregular and spurious; and it should be carefully borne in mind that a V. presenting any deviation from the perfect character of the vesicle and the regular development of the areola is not to be relied on as protective against smallpox. As a general rule, neither the local nor the constitutional symptoms of ordinary V. require any treatment.

Investigations conducted several years ago by order of the Brit. govt. (see *Reports of the Medical Officer of the Privy Council*), whose scope included the arms of nearly half a million children, showed that V., especially among the poor, is often so imperfectly performed as to leave no mark and to exert no protective power. In general, with observance of all precautions, V. should not fail of success in more than one case out of 150 to 170 cases. The official inquiries above referred to showed that not more than one vaccinated child in eight had been so vaccinated as to have the highest possible degree of protection; and not more than one in three could, on the most indulgent estimate, be considered well protected. The main causes of imperfection were the following: (1) the frequency with which practitioners, instead of attempting fully to infect the system, had been satisfied with insertions of lymph sufficient to produce only one, two, or three ordinary vesicles; (2) lack of due attention to *selection* of the lymph used; (3) carelessness and clumsiness in the performance, producing either failure or (usually) less perfect effect; (4) unnecessary substitution of preserved and conveyed lymph for vaccination direct from the arm. Observations by Drs. Buchanan and Seaton during the epidemic of smallpox in London 1863, on more than 50,000 children in national and parochial schools, work-houses, etc., showed that, of every 1,000 children without any mark of V., 360 had scars of smallpox; while of every 1,000 children who had evidence of vaccination, only 1·78 per 1,000 had any such traces: and with regard to the quality and amount of the V., it was found that, of children having four or more cicatrices, only 0·62 per thousand had any trace of smallpox; while of those who had a single bad mark, 19 per 1,000 were scarred by smallpox. Hence the best V. was more than 30 times as protective as the worst, and the worst was more than 47 times better than none at all. Records of more than 15,000 cases at the Smallpox Hospital in London showed that, while the unvaccinated died from smallpox at the rate of 37 per cent, the vaccinated died at the rate of only 6½ per cent.; the mortality among those with four or

more scars being only 0·55, while that among those with only a single scar was 7·73 per cent. (See, further, a paper read by Dr. W. B. Carpenter before the Soc. for the Abolition of Compulsory Vaccination in 1882—subsequently republished.) It is to be noted, further, that the protective power of vaccination shows itself in two ways—(1) in shielding the constitution, in the great majority of cases, from any kind of attack of smallpox; (2) in the exceptional occurrence of smallpox in those vaccinated, in so modifying the disease as almost invariably to deprive it of danger to life, or of the disfigurement frequently left by the unmodified disease.

With regard to *revaccination*, its utility and necessity are abundantly demonstrated by experience. This operation should be performed with the same care and pains as primary V.; and it should not be left to periods when smallpox is epidemic, but should be performed on all persons after puberty—this being the more necessary on account of uncertainty as to the perfect success of the primary operation. During an epidemic of smallpox, even young children, if the marks of the primary V. are at all imperfect, should decidedly be revaccinated. In revaccinating, it must always be remembered that the local results of revaccination give no information whatever as to the constitutional condition in which the revaccinated person was with regard to the liability to contract smallpox.

Much has been written regarding the *dangers of vaccination;* and the well-known Rivalta case, in which an infant thus communicated syphilis to a whole population in a remote district of Piedmont (see SYPHILIS), and some deaths from (as was alleged) V. with impure lymph, have directed attention to the subject. On this subject, see Simon's *Papers relative to the History and Practice of Vaccination.* We add only that those who have had most to do with V., and those who have had the most extensive experience in the diseases of children, concur in the belief of the general non-communicability of disease by this operation.

The relations between smallpox in man and cow-pox in the cow claim a passing remark. Jenner believed that the two diseases were essentially the same, and that they had a common origin in the grease of the horse. Various experiments in inoculating healthy cows with smallpox virus—thus obtaining a supply of genuine vaccine lymph—place the identity of the diseases beyond question. The disease really known as 'grease' appears to have nothing to do with cow-pox or smallpox; but the horse occasionally suffers an affection precisely the same as the smallpox in man and the cow-pox in cows; and the lymph from this horse-pox has been successfully used for vaccination. (For methods similar to V. to prevent splenic fever, etc., adopted by Pasteur, see GERM-THEORY.)

VACCINE, a. *văk'sĭn* [F. *vaccin*, vaccine matter—from L. *vaccīnus*, of or from cows—from *vacca*, a cow: It. *vaccino*]: pertaining to or derived from cows, as *vaccine* matter: N. the virus of cow-pox used in vaccination; 'lymph.' VAC'CINATE, v. *-sĭ-nāt*, to inoculate with vaccine matter or the cow-pox, as a preventive of smallpox. VAC'CINATING, imp. VAC'CINATED, pp. VAC'CINATOR, n. *-nā-tĕr*, one who vaccinates. VAC'CINA'TION, n. *-nā'shŭn*, the act or practice of inoculating persons with the cow-pox in order to secure them from attacks of the smallpox. VACCINIA, n. *văk-sĭn'ĭ-ă*, an eruptive vesicular disease, originally of the cow, now introduced into the human system as a protection against smallpox. VACCIN'IFER, n. *-sĭn'ĭ-fĕr* [Eng. *vaccine;* L. *fero*, I bear]: one from whose body lymph is taken for the purpose of vaccination. VACCININ, n. *văk'sĭ-nĭn*, a fat which replaces others in butter. VACCINIC ACID, an acid found in butter.

VACCINIACEÆ, *văk-sĭn-ĭ-ā'sē-ē:* natural order of exogenous plants, differing from *Ericaceæ* chiefly in having an inferior ovary and succulent fruit. Many botanists make it a section of *Ericaceæ;* in Gray's Botany it is the sub-order *Vaccinieæ*. About 200 species are known, natives of temperate climates, in all parts of the world, chiefly in the n. hemisphere. A few species, remarkable as being parasitic, are natives of Peru. The V. are shrubs, and rarely small trees; with numerous round or angular branches, simple leaves on very short stalks, and flowers solitary or in racemes. Whortleberries (q.v.) and Cranberries (q.v.) are the most familiar examples of the order. The species are numerous in N. America, the genus *Gaylussacia* being known as Huckleberry, and the genus *Vaccinium* (including Cranberry, Cowberry, Bilberry, etc.) having nearly 20 species and varieties in the n. and middle states e. of the Mississippi river.

VÂCH [Skr., speech]: one of the names of Saraswatî (q.v.), the female energy of the Hindu god Brahma.

VÂCHASPATI ['lord of speech,' from Skr. *vâch*, speech; *pati*, lord]: in Hindu mythology, a name of *Vr'i-haspati* (q.v.), the instructor of the gods.

VACILLATE, v. *văs'ĭl-lāt* [L. *vacillātus*, pp. of *vacillārĕ*, to sway to and fro: It. *vacillare;* F. *vaciller*]: to waver; to fluctuate in mind or opinion; to be unsteady or inconstant. VAC'ILLATING, imp.: ADJ. unsteady; inclined to fluctuate in opinions or resolutions; unstable; inconstant. VAC'ILLATED, pp. VAC'ILLATINGLY, ad. *-lĭ*. VAC'ILLA'TION, n. *-lā'shŭn* [F.—L.]: a moving one way and the other; unsteadiness; a fluctuation of mind. VAC'ILLANT, a. *-lănt* [F.—L.]: wavering; unsteady; fluctuating. VAC'ILLATORY, a. *-lă-tō-rĭ*, vacillating; unsteady; unreliable.

VACUIST, VACUITY: see under VACUUM.

VACUOLE, n. *văk'ū-ōl*, [L. *vacŭus*, empty]: in *bot.* and *animal histology*, clear space of indefinite size and arrangement in the protoplasm of a cell; in *zool.*, small cavity found in the interior of many of the Protozoa, caused by the presence of little particles of food. VAC'UOLA'TED, a. *-lā'tĕd*, full of vacuoles. VAC'UOLA'TION, n. *-lā'shŭn*, the process of developing vacuoles.

VACUUM, n. *văk'ū-ŭm* [L. *vacŭum*, an empty space; *vacŭus*, empty: It. *vacuo*, emptiness]: a space empty or devoid of matter solid or aeriform; the opposite of plenum. IN VACUO, *ĭn văk'ū-ō* [L.]: in empty space. VAC'UIST, n. *-ĭst*, one who regards a perfect vacuum in nature possible, as opposed to *plenist*, which see. VACUITY, n. *vă-kū'ĭ-tĭ* [F. *vacuité*—from L. *vacuĭtas* or *vacuĭtātem*]: space unfilled or unoccupied by matter; emptiness; void; inanity; thoughtlessness, as *vacuity* of countenance. VACUOUS, a. *văk'ū-ŭs*, empty. VAC'UOUSNESS, n. *-nĕs*, state of being empty. VACUUM-BRAKE, a continuous brake used on railways, in which a partial vacuum is produced in a continuous tube on the cars by means of a steam-jet on the locomotive. Connected with this tube are collapsing bellows which close when exhausted of the air in them, thus drawing the brake-rods (see BRAKE). VACUUM-PAN: see SUGAR—*Manufacture.* VACUUM-PUMP, a pump connected with the boiler of a marine engine which creates a vacuum, the water from the sea being thus forced into the boiler by the greater pressure of the atmosphere. TORRICELLIAN VACUUM: see TORRICELLI, EVANGELISTA: TORRICELLIAN.

VAC'UUM: empty space, or space wholly devoid of matter. From Aristotle to Descartes, metaphysical speculators took the question into their own hands, and wrote absurdities about it. Thus, Descartes says that, if a vessel be perfectly empty, its sides must be in contact—confounding the totally distinct ideas of *matter* and *space.* The dictum that *nature abhors a vacuum* was employed to account for the rise of water in pumps; but it was presently found that nature did not, in this case, abhor a V. through more than an elevation of about 32 ft.: see TORRICELLI, EVANGELSTA. When the subject was taken up by its legitimate investigators, the experimental philosophers, such absurdities disappeared, but real difficulties were brought to light. So far as experiment has yet shown, it may be inferred that V. cannot exist. The interstellar spaces, though probably devoid of ponderable substance ordinarily known as matter, or at most only occasionally visited by it, are believed to be pervaded by the luminiferous medium: see ETHER: UNDULATORY THEORY. That this is Matter (q.v.), is inferred from the effects of its vibrations on the eye. It is not merely for providing a medium that seems indispensable for the passing of light and heat that the assumption seems unavoidable that the universe is a *plenum:* Newton expressly said (see FORCE, for the quotation at greater length) 'That gravity should be innate, inherent, and essential to matter, so that one body may act upon another at a distance through a *vacuum*, without the mediation of anything else, by and through which their action

and force may be conveyed from one to another, is to me so great an absurdity that I believe no man who has in philosophical matters a competent faculty of thinking can ever fall into it.' This sweeping assertion is believed to be substantiated by modern observations of a connection between sun-spots, planetary configurations, and terrestrial magnetism, obviously requiring some material of mediation between the sun and its secondaries; also by Faraday's electrical discoveries.

But, in ordinary language, a V. is said to be produced (more or less *perfect*) when ordinary ponderable matter, such as air, is more or less completely removed from the interior of a closed vessel. Till the beginning of the 19th c., the most pérfect V. that could be obtained was what is called the Torricellian V.—i.e., the space above the mercury in a carefully filled barometer tube. Such a V., however, is almost useless for experimental purposes; moreover, it contains mercurial vapor.

A suggestion of Davy, recently reinvented and greatly improved by Andrews, gives the means of procuring a much more perfect V. An ordinary air-pump removes all but about the $\frac{1}{120}$ of the gas in the receiver—i.e., produces a V. of about $\frac{1}{4}$ inch, as it is called. But if the gas employed be carbonic acid, admitted and pumped out several times, for riddance as far as possible of the last trace of air, the remaining gas will be almost wholly taken up by means of moistened caustic potash previously placed in the receiver. Concentrated sulphuric acid also should be present, to desiccate the potash when it has done its work. In this way Andrews easily obtained a V. of about $\frac{1}{4500}$ of an inch, which remained unchanged for a fortnight. Here all but $\frac{1}{135000}$ of the air had been removed. Further improvements, devised by Frankland, Gassiott, and others, have been made in this process, especially for production of (so-called) vacuum-tubes for the study of electrical discharges; and the exhaustion has been sometimes carried so far that the attenuated matter remaining was unable to conduct the discharge of an induction-coil.

VADE, v. *vād* [the same word as *fade*]: in *OE.*, to fade; to vanish; to pass away. VA'DING, imp. VA'DED, pp.

VADE-MECUM, n. *vā'dē-mē'kŭm* [L. *vadĕ*, go; *mecum*, with me]: a book or other thing which a person carries with him as a constant companion; a pocket-companion or guide; a manual; a handbook.

VAGA, PIERINO DEL, *pē-ā-rē'no dĕl vâ'gâ* (PIETRO BUONACCORSI, *pē-ā'tro bô-ōn-ŭk-kor'sē*): painter: 1500–47; b. near Florence, Italy. While a little boy he evinced artistic taste, and at the age of 11 years became a pupil of Ridolfo Ghirlandaio, under whom he studied drawing. Accompanying a Florentine artist to Rome, Pierino (little Peter) was recommended by Giulio Romano to the notice of Raffaelle, and became his assistant: with Giulio Romano and Francesco Penni, V. completed the works left unfinished by Raffaelle at his death. At Genoa V. worked on the decorations of the Doria palace. Later he formed

a great school in Rome. His most celebrated paintings are the *Creation of Eve* (Vatican) and the *Muses and Pierides* (Louvre).

VAGABOND, a. *văg'ă-bŏnd* [F. *vagabond*, a vagabond—from L. *vagabundus*, strolling about—from *vagor*, I wander; *vagus*, wandering; It. *vagabondo*]: wandering; having no settled home or habitation; unsettled; idle: N. an idle fellow without a settled home; a wanderer; a vagrant; a scamp. VAG'ABONDAGE, n. *-bŏnd-āj* [F.], or VAG'ABOND ISM, n. *-ĭzm*, the idle unsettled life of a vagabond.

VAGARY, n. *vă-gā'rĭ*, VAGA'RIES, n. plu. *-rĭz* [L. *vagāri*, to wander, to roam: It. *vagare:* F. *vaguer*]: a wandering of the thoughts; a wild freak; a whimsical purpose; a capricious frolic. *Note.*—VAGARY is probably only an accommodation to the L. *vagāri* in spelling, the true origin being found in some such imitative word as Scot. *figmaleery* or *whigmaleery;* OE. *fegary*, a whim, a freak, crotchet: Ger. *larifari*, syllables without sense, nonsense.

VAGINA, n. *vă-jī'nă* [L. *vagīna*, a scabbard, a sheath: It. *vagina:* F. *vagin*]: a sheath; in *bot.*, the sheath formed by the basal part of certain leaves where they embrace the stem: in *anat.*, the canal or passage which leads from the vulva or external orifice to the uterus; any part which completely surrounds another. VAGI'NAL, a. *-năl* or *văj'ĭ-năl*, pertaining to the vagina; resembling a sheath. VAGI'NANT, a. *-nănt*, serving to invest or sheathe. VAGI'NATE, a. *-nāt*, or VAGI'NATED, a. *-nā-tĕd*, furnished or invested as with a sheath. VAGI'NO-PENNOUS, a. *-nō-pĕn'nŭs* [L. *penna*, a wing or feather]: having the wings inclosed in a sheath; sheath-winged.

VAGINULA, n. *vă-jĭn'ū-lă*, or VAGINULE, n. *văj'ĭn-ūl* [L. *vagīnŭla*, a little sheath—from *vagīna*, a sheath]: in *bot.*, a sheath surrounding the basal portion of the archegonium in mosses.

VAGRANT, a. *vā'grănt* [Norm. F. *vagarant*—from L. *vagāri*, to wander: It. *vagare;* F. *vaguer*, to ramble]: wandering from place to place; roving; having no fixed habitation; unsettled: N. one who has no settled abode; an idle wanderer; a sturdy beggar; a vagabond; a tramp. VA'GRANTLY, ad. *-lĭ*, in a vagrant manner. VA'GRANCY, n. *-grăn-sĭ*, unsettled condition; life or habits of one without a fixed habitation.—*Vagrants* or tramps are classed in Eng. law as (1) idle and disorderly persons, able, in whole or in part, to maintain themselves and their families, but who neglect to do so; (2) rogues and vagabonds, persons suspected of living by crime; (3) incorrigible rogues. Vagrants of the first class are liable to one month's imprisonment with hard labor; those of the second class to 3 months imprisonment and hard labor; while those of the third class are liable to be committed for trial at the sessions, to be kept to hard labor in the interim, and, after conviction, to be sentenced to one year's imprisonment and hard labor, with whipping in the case of males.

In most of the United States various enactments and ordinances of more or less severity have been made for sup

pression and punishment of vagrants and tramps; but such characters are still numerous. They often pretend to be going about in search of work; but though there are doubtless some unfortunate honest workmen among them (who, if they could be selected from the mass, should receive all possible consideration and aid in securing work), the great majority of tramps form a class who, from mental constitution, would almost rather die than work. It is hard to understand what inducements can lead them to prefer their wandering and shifty life. Apparently the freedom of it and the immunity from work are its chief attractions. They have been well described as wandering about 'ready for any crime, but not planning crimes; quite ready to rob, but very much afraid of large dogs; very courageous against unprotected women, but skulkers when a broad-shouldered laborer turns his eyes their way; with no purpose except wandering, no restraint except hunger, no hope except of getting drunk upon some lucky haul, nomads in the midst of civilization, simple savages without savage resources.'—See BEGGAR: POOR, THE—POOR LAWS.

VAGUE, a. *vāg* [F. *vague*, empty, vague—from L. *vagus*, strolling about, wandering: It. *vago*]: not settled or definite; loose; unfixed; ill-defined; proceeding from no reliable source, as a report; in *OE.*, wandering or unsettled. VAGUE'LY, ad. *-lĭ*. VAGUE'NESS, n. *-nĕs*, state of being uncertain or unsettled; looseness; indefiniteness.—SYN. of 'vague': unsettled; indefinite; ambiguous; undetermined; lax; flying; hazy; doubtful; uncertain.

VAIL, n. *vāl* [a mere abbreviation of *avail*, the anc. Eng. term signifying money given to servants, casual emoluments of an office]: in *OE.*, money given to servants by employers, visitors, or others, as a perquisite or present—hence applied to any similar profits or advantages; customary or stipulated perquisites to servants; also spelled VALE, n. *vāl*—usually in the plural. *Note.*—Money as a gratuity given to a servant by a visitor, and to others, is now usually called a 'tip' in slang.

VAIL, n. *vāl* [same as VEIL, (q.v.)]: that which hides or conceals; a curtain; a separating screen.

VAIL, v. *vāl* [a contr. of OE. *avale*, which see]: in *OE.*, to let fall; to cap to a superior; to express respect or submission by uncovering; to let fall in token of respect, as the sail of a ship at sea; to fall; to let sink in fear; to yield in token of respect. VAIL'ING, imp. VAILED, pp. *vāld*.

VAIN, a. *vān* [F. *vain*—from L. *vānus*, vain, empty: Icel. *vanr*, vain, void: It. *vano:* comp. Gael. *faoin*, foolish, idle, empty]: proud of trifling attainments or petty things; having an unduly high opinion of one's own accomplishments; conceited; ineffectual; fruitless, as an effort; unsatisfying; false. VAIN'LY, ad. *-lĭ*, in a vain manner; foolishly; without effect; to no purpose; idly. VAIN'NESS, n. *-nĕs*, vanity; fruitlessness. VAINGLO'RIOUS, a. proud or boastful to excess of one's own attainments or performances; self-proud. VAINGLO'RIOUSLY, ad. VAINGLO'RY, n. self-pride; excessive pride in one's own performances.

VANITY, n. *vān'ĭ-tĭ* [F. *vanité*—from L. *vanĭtas*, emptiness]: empty pride inspired by an overweening opinion of one's own importance; anything empty, visionary, or unsubstantial; vain pursuit; idle show; ostentatious arrogance; petty pride. IN VAIN, ad. to no purpose; ineffectually.—SYN. of 'vain': showy; ostentatious; idle; worthless; unimportant; empty; unreal; shadowy; light; inconstant; false; deceitful; delusive; trifling; useless;—of 'vanity': arrogance; presumption; self-conceit; pride; haughtiness; egotism; emptiness; worthlessness; ostentation.

VAIR, n. *vär* [F. *vair*, a kind of fur in heraldry—from L. *varĭus*, different, variegated: It. *vario*, various]: the skin of a species of squirrel, much used in the 14th c. as fur for garments; in *her.*, a series of small shields placed close together, alternately blue and silver, intended to represent the appearance of the skins when sewed edge to edge. VAIRÉ, a. *vā'rā*, or VAIRY, a. *vär'ĭ*, in *her.*, charged with vair: see HERALDRY.

VAIS'ESHIKA, *vī-sā shē-kâ:* one of the two great divisions of the *Nyâya* (q.v.) school of Hindu philosophy, probably a later development of the Nyâya itself, properly so called, with which it agrees in its analytical method of treating the subjects of human research, but from which it differs in arrangement of topics, and especially by its doctrine of atomic individualities or *vis'eshas*—whence its name is derived.

The topics or categories (*padârthas*) under which *Kan'âda*, founder of this system, arranges his subject-matter, are the following six: (1) substance, (2) quality, (3) action, (4) generality, (5) atomic individuality, and (6) co-inherence; and later writers of his school add a seventh category, non-existence. 1. Substance is the intimate cause of an aggregate effect; it is that in which qualities abide, and in which action takes place: it is ninefold—viz., earth, water, light, air, ether, time, space, soul, and *manas*, or the organ of affection. 2. Quality is united with substance: it comprises 24 terms, of which the following are specimens—color, odor, number, dimension, severalty, conjunction, priority, gravity, fluidity, sound, understanding, pleasure, pain, desire, volition, merit, demerit. 3. Action consists in motion, and abides in substance alone: it affects a single, that is, a finite substance, which is matter; and it is either motion upward or downward, or contraction or expansion, or motion onward. 4. Generality abides in substance, quality, and action: it is of two kinds—genus and species. 5. Atomic individuality resides in eternal substances, by which are meant the organ of affection, soul, time, space, ether, earth, water, light, and air: it is the ultimate difference, technically called *vis'esha;* such differences are endless; and two atoms of the same substance, though homogeneous with one another, differ merely so far as they exclude one another. 6. Co-inherence, or perpetual intimate connection, resides in things which cannot exist independently from one another, such as the parts and the whole, quality and the thing qualified, action and agent, species

and individual, atomic individuality and eternal substance. 7. Non-existence, the last category, added by the modern Vais'eshikas, is defined by them as one of the following: non-existence which is without beginning, but has an end —as that of a jar, which did not exist until its antecedent non-existence ceased when being formed out of the clay, or non-existence which has a beginning, but no end—as that of a jar smashed by the blow of a mallet; or absolute non-existence, which, extending through all times, has neither beginning nor end—as when it is said that a jar is not on the ground; or mutual non-existence, which is the reciprocal negation of identity—as when it is remarked that a jar is not a piece of cloth. The nature of each of these substances, qualities, actions, etc., is, then, the subject of special investigation.

According to the Vais'eshika system, understanding is the quality of *soul*, and the instruments of right notion are treated of under the head of 'understanding (*buddhi*).' Kan'âda admits of only two such instruments, or *pramân'as*—viz., knowledge which arises from the contact of a sense with its object, and inference. Comparison, revelation, and the other instruments of right notion mentioned in other systems, the commentators endeavor to show are included in these two —See Eng. translations of portions of Kan'âda's works, by Dr. Ballantyne (Mirzapore 1851, and Calcutta 1848), and by Dr. Roer in *Bibliotheca Indica* (Calcutta 1850); also essays on the V. system by H. T. Colebrooke (*Miscellaneous Essays*, I. Lond. 1837), and Prof. M. Müller in vols. VI., VII., of the *Zeitschrift der deutschen morgenländischen Gesellschaft.*

VAISHN'AVAS, *vish'na-vaz:* one of the three great divisions of Hindu sects: see INDIA—*Religion.* The word, derived from *Vishn'u* (q.v.), designates the worshippers of this deity, and comprises a great variety of sects, and a variety differing in different periods of the mediæval history of India, so that old accounts no longer apply. The common link of all the sects comprised under the name V. is their belief in the supremacy of Vishn'u over the other gods of the Trimûrti (q.v.). The following are the principal sects of this division:

1. The *Râmânujas,* or *S'rî Vaishn'avas,* or *Srî Sampradâyins*—who originated from *Râmânuja,* a reformer, born at Perumbur, in s. India, about the middle of the 12th c., and considered by his followers as an incarnation of *S'esha* (q.v.), the serpent of Vishn'u. This sect has various subdivisions. Their most striking peculiarity is the preparation and the scrupulous privacy of their meals; for should the meal during its preparation, or while they are eating, attract even the looks of a stranger, the operation is instantly stopped, and the viands buried in the ground. They distinguish themselves from other sects by perpendicular and transverse lines drawn with a white earth on their foreheads and other parts of their bodies; also they wear a necklace of holy wood and carry a rosary. Their principal religious tenet is that Vishn'u is the cause and creator of all worlds; that he and the universe are one,

though he is of a twofold form: the supreme spirit or cause, and the gross one, the effect or matter. One of their distinctions from the Vedânta (q.v.) is that they regard their supreme deity as endowed with qualities.

2. The *Râmânandas*, or *Râmâvats*—by far the most numerous class of sectaries in Gangetic India. They belong chiefly to the poorer and inferior classes, except for their inclusion of the Rajputs and military Brahmans. The founder of this sect was *Râmânanda*, assigned to a date between the 13th and the 15th c., and who resided at Benares. The especial object of their worship is Vishn'u, in his incarnation as *Râmachandra*, and his consort *Sîtâ*. They are distinguished by their disregarding the distinction of caste among the religious orders. Their sectarian marks are like those of the Râmânujas.

3. The *Kabîr Panthis*—important sect, whose founder was Kabîr, one of the disciples of Râmânanda, above mentioned, and whose date therefore was probably about the end of the 14th c. According to the doctrine of this sect, there is but one God, creator of the world; but, in opposition to the Vedânta (q.v.), they assert that he has a body formed of the five elements of matter, and a mind endowed with the three *gun'as*, or qualities: he is of ineffable purity and irresistible power, eternal, and free from the defects of human nature, but in other respects does not differ from man; so that the pure man is his living resemblance, and after death becomes his equal and associate. God and man are therefore not only the same, but both in the same manner are everything that exists. The desire of the deity to renew the world assumed the shape of a female form; and this form is Mâyâ (q.v.), or illusion, with whom he begot the triad, Brahman, Vishn'u, and S'iva. To understand the falsehood of Mâyâ is the chief aim of man; and so long only as he is ignorant of the source of life, he is doomed to Transmigration (q.v.). Life, they teach, being the gift of God, must not be violated by His creatures. Humanity and truth are two of their cardinal virtues; retirement from the world is deemed desirable; and implicit devotion to the Guru, or spiritual teacher, a supreme duty. It is no part of their faith to worship any deity, or to observe any ceremonies and rites of the Hindus; but they are recommended outwardly to conform to all the usages of tribe and caste, and some even pretend to worship the usual divinities. They have no prescribed mode of dress. Strictly they can scarcely be included among Vaishn'ava sects; yet because of their paying more respect to Vishn'u than to any other god of the Trimûrti (q.v.), and of their friendly intercourse with most of the Vaishn'ava, they are always included with them. They have many subdivisions.

4. The *Vallabhâchâryas*, or *Rudra Sampradâyins*—a sect said to have been founded by *Vishn'u Swâmin;* but his successor, *Vallabha Swâmin*, or *Vallabha Acha'rya* (1479–1532), must be considered the real founder. The tradition is that in his 12th year he began to propagate his tenets. He gained converts, was introduced to the court

of the king of Vijayanagara, was elected as chief of the Vaishn'avas, travelled for nine years through India, and then was honored by a visit from the god *Kr'ishn'a* in person, who enjoined him to introduce his worship, and to found the religion now so widely diffused throughout w. India under the sectarian name *Rudra Sampradâya*. Vallabha ultimately settled at Benares, and there composed 17 works in Sanskrit His sons and grandsons all were teachers and heads of communities of the sect the most famous being Gokulnâthji (b. 1551). The chiefs of this sect have the title Mahârâj or 'great king;' and the members are of the better or wealthier classes of Hindus. The Mahârâjas, though many of them are ignorant and devoid of sanctity, receive from their followers unlimited homage, solely because of their descent from the founder: at present they number 60 to 70. This sect is widely diffused throughout Bombay, Cutch, Kattywar, and central India, and especially the province of Malwa; and their establishments and temples are numerous throughout the country. The chief authority of the sect is the *Bhâgavata Purân'a* (q.v.), and after it the works of Vallabha. The object of their adoration is Vishn'u (q.v.) in his incarnation as Kr'ishn'a. Among the ten principles of the sect, as laid down by Vallabha, are the following: To secure the firm support of Vallabhâchârya: To forsake the sense of Vaidik opinion and be a suppliant to Kr'ishn'a: To believe that Vallabha is a Gopî, or mistress of Kr'ishn'a: To swell the heart with the name of Kr'ishn'a: To adopt the society of the good, knowing them divine. Out of this code grew up the doctrine that the Guru or Mahârâj is the impersonation of Kr'ishn'a himself, that God and the Guru are necessarily to be worshipped, and that the sectary is bound to bestow on him 'his body, organs of sense, life, heart, and other faculties, and wife, house, family, property, with his own self'—a tenet which has led to the grossest abuses. The temples of the sect have images of Kr'ishn'a, and Râdhâ, his principal wife; the former representing a chubby boy, of dark hue, richly decorated, and eight times a day receiving the homage of his worshippers: these ceremonials include the washing and dressing of the image, which is then presented with refreshments, and anointed and perfumed, after which it is visited while it holds a public court. Annual festivals also are observed. The sect wear distinctive marks on the forehead and elsewhere.

5. The *Mâdhwâchâryas*, or *Brahma Sampradâyins*—a sect founded by a Brahman, *Mâdhwâchârya* (b. 1199), who is regarded as an incarnation of Vâyu, the god of wind, after having been incarnate in preceding ages as Hânumat (q.v.) and Bhîma. It seems that he was originally a priest of the S'aiva faith, and encouraged an attempt at compromise between the S'aivas and Vaishn'avas; and in the temples of his sect, images of S'iva are allowed to partake of the worship offered to those of Vishn'u. The essential dogma of this sect is the identification of Vishn'u with the Supreme Soul, as the pre-existent cause of the universe; and this primeval Vishn'u they affirm to be endowed with

real attributes, and, though indefinable, to be most excellent and independent. But besides this independent, there is also a dependent principle; for besides the Supreme Soul, *Paramâtman*, there is a living Soul, *Jîvâtman*, which is dependent on the Supreme; and though indissolubly connected with, yet not the same with him. In consequence, they deny the absorption of the human soul into the universal spirit, and the loss of independent existence after death. Thus they differ on a vital point of doctrine from other Vaishn'ava and S'aiva sects. The modes of worshipping Vishn'u they declare to be three: marking the body with his symbols, especially by a hot iron; giving his names to children and objects of interest; and the practice of virtue in word, act, and thought. Final liberation, or freedom from future birth, they consider as the reward for having secured the favor of Vishn'u. The Gurus or superiors of this sect are Brahmans and ascetics, or profess cenobitic observances; the disciples live in their *Maths*, or monasteries, and profess perpetual celibacy. The marks common to the Gurus and the lay votaries are the symbols of Vishn'u on shoulders and breast, and the frontal mark.

6. The *Vaishn'avas of Bengal*—sect forming one-third to one fifth of the population of the province; were founded by *Chaitanya*, b. 1485. He is regarded as an incarnation of Kr'ishn'a. At the age of 24 he became an ascetic, travelled and taught his doctrine, and had frequent visions of Kr'ishn'a. According to the doctrine of the sect, *Kr'ishn'a* is the Supreme Spirit, who, for various purposes, assumed specific shapes, in which he became incarnate (see VISHN'U). An important innovation is the doctrine of *Bhakti*, or faith, which is held to be more efficacious than knowledge, or charity, or virtue—so efficacious, indeed, that all castes become by such faith equally pure, and therefore all castes are admissible into the sect. Their chief ritual is very simple; it consists of constantly repeating the name of Kr'ishn'a—a practice of which one of their chiefs, Haridâs, set them a remarkable example, as during many years, when he resided in a thicket, he repeated the name of Kr'ishn'a 300,000 times daily. Their other duties are sixty-four in number; but the most important of their obligations is their servile veneration of the spiritual teacher, whom they are bound to regard as the deity himself, and even as of more authority; for they are taught that 'the prayer is manifest in the Guru, and the Guru is Vishn'u himself.' Liberation from terrestrial existence most votaries of this sect do not conceive in the spirit of the Vedânta, which teaches that final deliverance is the absorption of the human soul into the divine essence; but, in their opinion, it is twofold: either perpetual residence of the soul in Swarga, or paradise, with possession of the divine attributes of power, etc.; or elevation to *Vaikun't'ha*, the heaven of Vishn'u, where they enjoy felicity. Besides several divisions of this sect, there are three which are secessions—the *Spasht'a Dâyakas*, the *Kartâ Bhâjas*, and the *Sâhujas*. The first of these is growing

in Calcutta, where their women act as the spiritual teachers of the women of respectable families: this sect deny the divine character and authority of the Guru. The second sect is a recent schism. Of the *Sâhujas*, the last of the three, little is known, their professions and practices being kept secret, but suspected to be immoral.

Besides these Vaishn'ava sects there are about a dozen others of less importance.—For fuller detail, see H. H. Wilson's *Sketch of the Religious Sects of the Hindus*, edited by Dr. Rost in Wilson's Works, I. (Lond. 1862); and on the Vallabhâchâryas, the *History of the Sect of the Mahârâjas* (by Karsandâs Mulji) (Lond. 1865).

VAISYA, n. *vīs'yă:* in *India*, the third or merchant caste of the Hindus: see CASTE: SUDRA.

VAIVODE, n. *vī'vōd:* formerly, a prince of the Danubian provinces; an inferior Turkish officer; also spelled WAIWODE, VOIVODE.

VAKEEL, n. *vâ-kēl':* in the *East Indies*, an ambassador; a representative; a native attorney or agent.

VALAIS, *vâ-lā'* (Ger. *Wallis*): canton of Switzerland; bounded n. by the cantons of Vaud and Bern, and s. by Italy; 2,026 sq. m. It forms one long and deep valley, included between two of the loftiest mountain chains of Europe—the Pennine and the Bernese Alps—and is drained by the Upper Rhone, which, rising at its n.e. extremity, in the glacier of the Gallenstock, falls at the w. boundary of the canton into the Lake of Geneva. No European territory is more completely isolated by mountains. The highest point of the canton is Monte Rosa, 15,127 ft. The greater part of the surface consists of barren mountain slopes; covered in their higher elevations with the greatest of the Swiss glaciers. The forests and pasture-lands supply the inhabitants with their chief occupations; but grain-cultivation also is carried on in the level ground, from a quarter of a m. to three m. wide, along the main channel of the river. The heat at the bottom of the valley is intense in summer, and Indian corn and the vine are successfully grown. V. is connected by great high-roads, and now by railway, with the other parts of French Switzerland and Savoy. The Grimsel and Gemmi passes connect the e. part with German Switzerland; and the Great St. Bernard and Simplon (q.v.) passes connect it with Italy. Cattle, the chief export of V., were formerly driven over the Simplon into Italy; but now the railway tends to divert this trade to w. Switzerland and France. The inhabitants of the Upper V.—one-third of the population—speak German; those of the Lower V., the Vaudois dialect of French. The inhabitants are mostly Rom. Catholics. V. is divided into 13 dixaines or 'tithings,' each of which has its council, and may be said to form a little republic. Each of the dixaines sends four members to a larger council or diet at Sion.—The upper part of V., during the middle ages, acknowledged a very slight feudal dependence on the German empire; the lower part belonged to Savoy. At the period of the struggle of the Swiss with the Duke of Bur-

gundy, the Upper V. took possession of the Lower V., and reduced it to a vassal state; it remained in this condition until 1798, the period of French conquest. Sion (q.v.) and Martigny (q.v.) are the chief towns.—Pop. (1880) 100,216, of which 866 were Protestants; (1900) 114,438.

VALANCE, n. *văl'ăns*, or VAL'ENCE, n. *-ĕns* [probably from having been made at *Valence*, in France]: drapery hanging round the head and stead of a bed, or from the head of window-curtains: V. to decorate with fringed drapery. VAL'ANCING, imp. VAL'ANCED, pp. *-ănst.*

VALCKENAER, *vâl'kĕh-nâr*, LUDVIG KASPAR: Dutch philologist: 1715–1785, Mar. 14; b. Leeuwarden. He studied at Franeker, and became prof. of Greek there 1741; of Greek antiquities 1755; and in 1766 was called to the chair of Dutch history at Leyden, where he died. V. was an admirable lecturer and commentator on the classics adding fine critical discernment and thoughtfulness to thorough knowledge of Greek literature and antiquities. Among his more notable works are his recasting of Ursinus's *Virgilius cum Scriptoribus Græcis Collatus* (Leeuwarden 1747): his ed. of the Greek grammarian Ammonius (Leyd. 1739; Leip. 1822), of the *Phœnissæ* (Franek. 1755; Leip. 1824) and the *Hippolytus* (Leyd. 1768; Leip. 1823); his *Diatribe in Euripidis Perditorum Dramatum Reliquias* (Leyd. 1767; Leip. 1824); his ed. of the so-called *Epistles of Phalaris* (Gröning. 1777). and of the *Idylls* of Theocritus (Leyd. 1779–81; new ed. Leip. 1810). Among his posthumous works are *Callimachi Elegiarum Fragmenta* (Leyd. 1799); *De Aristobulo Judæo* (Leyd. 1806); and *Opuscula Philologica, Critica, Oratoria* (2 vols. Leip. 1808).

VAL'DAI HILLS: see NOVGOROD.

VALDEPEÑAS, *vâl-dā-pān'yâs:* town of Spain, prov. of Ciudad Real; 30 m. e.s.e. of the city of that name. It is a straggling mud-built town, in a district noted for its red wine.—Pop. about 16,000.

VALDIVIA, *vâl-dē'vē-â:* city of Chili, cap. of the prov. of V.; on the river V., 470 m. s. of Santiago; lat. 39° 49′ s., long. 73° 15′ w. It has one of the best harbors on the Pacific coast.—Pop. 6,000.

VALDIVIA, *vâl-dē'vē-â*, PEDRO DE: soldier: about 1505–59; b. Spain. He was in the memorable battle of Pavia 1527; accompanied Pizarro to Peru 1532; served in the conquest of Venezuela 1535; rendered effective service to Pizarro in his struggle with Almagro; conquered Chili 1540, and there founded the cities Santiago and Coquimbo. On the assassination of Pizarro, V. returned to Peru and sided at first with Pizarro's bro. Gonzalo against the viceroy, but afterward aided the royal gov. in suppressing Gonzalo's rebellion. Then, as capt.gen. of all the regions s. of Peru, V. made several brilliant military expeditions, and founded the cities Concepcion, Villa Imperial, Villa Rica, Valdivia. He was taken prisoner and put to death by the Araucanians.

VALE, n. *vāl:* a poetic word for VALLEY (q.v.).

VALE: see VAIL 1.

VALEDICTION, n. *văl'ĕ-dĭk'shŭn* [L. *valĕ*, farewell; *dictus*, pp. of *dicĕrĕ*, to say]: farewell; a bidding farewell. VAL'EDIC'TORY, a. *-dĭk'tĕr-ĭ*, bidding farewell: N. in *Amer. colleges*, an oration or address delivered on bidding farewell.

VALENCE, *vâ-lŏngss'*: town of France, cap. of the dept. of Drome; on a hill on the left bank of the Rhone, here spanned by a fine suspension bridge; 65 m. s. of Lyon, on the railway to Marseilles. The walls with which it is surrounded give it a gloomy appearance, and the streets are narrow. It is the seat of a bp., and has a cathedral founded in the 3d c., but rebuilt in the 11th c., and consecrated by Urban II. 1095. Silk-weaving and silk-throwing are among the chief industries, and there is considerable trade in silk, fruits, wines, etc.—Pop. (1891) 22,947.

VALENCIA, *vâ-lĕn'shĭ-a*, Sp. *vâ-lĕn'thē-â:* province of Spain; one of three provinces into which the former 'kingdom' of V. was divided 1834, the others being Alicante and Castellon de la Plana (see SPAIN); bounded n. by Teruel and Castellon de la Plana, e. by the Mediterranean, s. by Alicante, w. by Albacete and Cuenca; 4,352 sq. m. V. occupies the centre of the ancient kingdom. Along its coast it is level, but rises toward the w. in a series of table lands which in some parts rise into mountains 4,000 ft. high. The principal rivers are the Guadalaviar and Jucar, which supply an extensive system of irrigation. Wheat, maize, barley, oats, rye, esparto-grass, and fruit of all kinds are extensively grown, and the mulberry is cultivated for silk. Numerous herds of sheep and goats are pastured on the higher grounds, and there is considerable coast fishing. The manufactures include silk, glass, pottery, leather, and soap.—Pop. (1900) 806,556.

VALEN'CIA: ancient city and port of Spain, formerly cap. of the kingdom of V., now of the prov. of V.; on the right bank and 3 m. from the mouth of the river Guadalaviar, 304 m. e.s.e. of Madrid by railway. The Huerta, or 'garden,' 35 sq. m. in extent, in which the city stands, resembles an immense orchard, and is ingeniously watered by an intricate network of pipes and rivulets, laid down by the Moors eight centuries ago. In this garden the carob, citron, orange, palm, and mulberry grow in wild luxuriance. V. is surrounded by battlemented walls, erected by Pedro IV. 1356; the interior of the city is striking and pleasing; most of the streets are macadamized; in the old quarters the houses are closely packed and gloomy-looking, but in the newer parts the buildings are high, gayly-colored, decorated with elegant iron-gilt balconies, and furnished with courts freshened with flowers and cooled by fountains. V. is the see of an abp., and its cathedral, La Seo, begun 1262, classical in the interior and Gothic in the exterior, is 350 ft. long, and at the transepts 216 ft. wide. In the cathedral and its chapels are a number of magnificent pictures, including some by Ribalta and Joanes. The custom-house, dating from 1758, is now

a cigar factory, employing 3,500 women. The univ., with public library of 42,000 vols., is well attended. Silk spining and weaving are extensively carried on, also hemp and cloth weaving, and manufactures of hats, glass, linen, leather, and V. tiles for flooring. V. is now a prosperous summer resort for the people of Madrid.

V., or *Valentia de Cid*, is very ancient. It was destroyed by Pompey, and rebuilt by Sertorius, after which it became a *colonia* or colony. It was taken by the Goths 413, and by the Moors 712. The *Cid* (see CID CAMPEADOR) took it 1094–5, and ruled despotically here till 1099. The union of Ferdinand and Isabella brought it under the Castilian crown. Suchet captured the city 1810.—Pop. (1884) 144,048; (1887) 170,763; (1900) 213,530.

VALEN'CIA: town of Venezuela, S. America, province of Carabobo; 85 m. w.s.w. of Caracas, about 2 m. e. of the Lake of V.; and about 20 m. from Puerto Cabello, on the coast, with which and with Caracas it has active trade. V. is finely situated in an exceedingly fertile district, in which cattle and horses are raised in great numbers.—Pop. (1894) 38,654.

VALENCIA, n., or VALENTIA, n. *va-lĕn'shĭ-a* [etym. not apparent]: fabric of worsted, cotton, and silk for vests.

VALENCIA, or VALENTIA, *vâ-lĕn'shĭ-a:* island on the s.w. coast of Ireland; part of county Kerry; separated from the mainland by a narrow arm of V. Bay; 38 m. w.s.w. of Killarney. It is 5½ m. long and 2 m. broad; the soil is in many places good; half the entire area is under cultivation. On the w. side, which is mainly high rocky moorland, are valuable slate and flag quarries. On the n. side is V. Bay, inlet of Dingle Bay; and V. harbor, the most w. in Ireland. Four Atlantic cables have been landed here, 1865, 66, 73, and 74. That laid in 1865 is not now in operation. Another Atlantic cable starts from Ballinskelligs Bay, a little to the s. of V. See ATLANTIC TELEGRAPH. Pop. 2,500.

VALENCIENNES, n. *vâ-lĕn'sĭ-ĕnz':* a rich lace, originally manufactured at Valenciennes in France.

VALENCIENNES, *vâ-lŏng-sē-ĕn':* town and fortress of France, dept. of Nord; on the Escaut or Scheldt, 155 m. by rail n.n.e. of Paris. It is well built, but contains few objects of attraction. There are many pleasant promenades in the immediate vicinity. V. is famous for a kind of lace extensively made here, as well as for fine cambrics and woven fabrics and gauzes. Salt-making and sugar-refining are carried on, and there is active trade in timber, wine, and oil. It is the centre of a rich coal-field yielding one-fourth of the coal produced in France. Hence there are numerous foundries, rolling-mills, and machine-shops. V. is the birthplace of Watteau and Froissart.—Pop. (1886) 22,919; (1891) 28,700; (1901) 30,946.

VALENCY, *văl'en-sĭ* or *vā'len-sĭ* [from L. *valans*, having power]: in *chem.*, the relative capacity for combining possessed by an atom as compared with an atom of hydro-

gen, assumed as a standard. Of some elements one atom can replace only one atom of hydrogen; of other elements one atom can replace 1, 2, 3, 4, or more hydrogen atoms. Thus, when sodium, Na, is dissolved in hydrochloric acid, HCl, each atom of Na replaces one hydrogen atom; but each atom of zinc, Zn, under the same circumstances, takes the place of 2 hydrogen atoms:

$$Na + HCl = NaCl + H$$
$$Zn + 2HCl = ZnCl_2 + H_2$$

The zinc atom, then, has twice the V. or twice the combining power that the sodium has. Similarly, antimony, Sb, and bismuth, Bi, form trichlorides, $SbCl_3$ and $BiCl_3$—an atom of Sb and Bi in each case taking the place of 3 H atoms. So, too, tin, Sn, in the tetrachloride, $SnCl_4$, and phosphorus, P, in the pentachloride, are equivalent to 4 H and 5 H respectively. The difference in combining or saturating power is represented thus: O'', B''', C'''', or C^{iv}, and so on. The chemical elements are classed with respect to V. as:

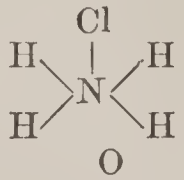
Univalent elements,	or	Monads,	e.g.,	H
Bivalent	"	" Dyads,	"	O''
Trivalent	"	" Triads,	"	B'''
Quadrivalent	"	" Tetrads,	"	C^{iv}
Quinquivalent	"	" Pentads,	"	P^{v}
Sexvalent	"	" Hexads,	"	W^{vl}

And elements of even V.—dyads, tetrads, hexads—are classed together as *artiads* [Gr. *artios*, even]; elements of uneven V.—monads, triads pentads—are designated *perissads* [Gr. *perissos*, uneven]. Another mode of expressing the V. of elements is that of arranging the symbols in diagrams in which each element is connected with others by a number of lines or connecting bonds corresponding with its degree of equivalence—a monad being connected with other elements by only one such bond, a triad by 3, a pentad by 5, etc.—e.g.:

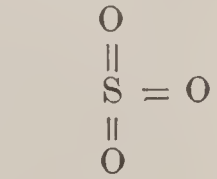
Water, H_2O ..... $H - O - H$

Carbon dioxide, CO_2 ..... $O = C = O$

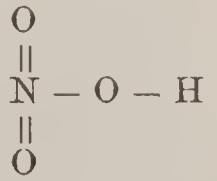
Ammonium chloride, NH_4Cl .....



Sulphuric oxide, SO_3 .....



Nitric acid, HNO_3 .....



It must be understood that these *graphic*, *structural*, or *constitutional* formulæ are not intended to represent the actual arrangement of the atoms in a compound. The

lines connecting the different atoms indicate simply the number of units of V. belonging to each atom, and the manner in which these units are disposed of by combination with those of other atoms.

Some elements are *multivalent*—i.e., exhibit varying degrees of V.—e.g., carbon is quadrivalent in marsh-gas, CH_4, bivalent in carbon monoxide, CO; sulphur is sexvalent in the trioxide, SO_3, but quadrivalent in the dioxide, SO_2, and bivalent in hydrogen sulphide, H_2S.

VALENS, *vā'lĕns* or *văl'ĕns*, Emperor of the East: 328–378, Aug 9 (reigned 364–378); b. near Cibalis, Pannonia: brother of Valentinian I. (q.v.), with whom he was associated in imperial authority, receiving, as his share of the empire, Asia, Egypt, and Thrace. His sovereignty was, however, disputed by Procopius, supposed scion of the race of Constantine, who raised his standard in Thrace, was crowned at Constantinople, and for two years held his ground with skill and courage, till the defeat of his troops at Thyatira and Nicosia, and his capture and cruel death, 366. The first prominent act of V.'s reign was a reduction of 25 per cent. in the taxes, which gained the general good-will of his subjects. The prolonged imprisonment of 3,000 Ostrogoths, sent to aid Procopius, led to a war 367–369: the contest was carried on in the country of the Goths, and was in favor of the Romans. Difficulties arose immediately afterward (370) with the Persians, who were desirous of possessing Armenia; and though the troops of V., as the ally of the Armenian monarch, frequently came into collision with those of Persia, war was not declared till the end of 372. The Romans were victorious. V., who had removed to Antioch at the beginning of the war, now occupied himself with the religious quarrels of the Arians and the orthodox party, then raging over the whole eastern empire. Incapable of independent judgment, he had adopted the views of his Arian councilors, and under their guidance punished the more obstinate of the 'heretics.' At the same time, a conspiracy, prompted by professors of magic arts, who declared that the name of V.'s successor should begin with *Theod*, was discovered, its promoters and agents punished with death, as well as those whose names began with that unlucky prefix. Affairs on the e. frontier again assumed a threatening aspect; but the Romans, disinclined further to interfere with the Persians, concluded a somewhat discreditable treaty 376. Meanwhile the Goths, who had for some time been peacefully settled in Dacia, were assailed by the advancing hordes of the Huns; the Ostrogoths, the first to feel the shock, were partly incorporated, and the remainder forced to retreat; the Visigoths next attempted to stem the torrent, but without success, and a multitude of fugitives crowded to the n. bank of the Danube. V. gave permission to a large body of Goths under Fritigern to cross into Mœsia and Thrace, and take possession of the waste lands in these provinces; the fugitive Ostrogoths soon afterward crossed the river without permission; and the alarm which the numbers and turbulence of his new subjects speedily

aroused led V. to the adoption of such impolitic measures that the gratitude of the Goths for the shelter afforded was turned to bitter resentment. V. resolved on war; and marching against the barbarians, engaged them near Adrianople 378, Aug. 9. His army was totally routed, and two-thirds of it, including V. himself and most of his chief officers, left dead on the field.—See Gibbon's *Decline and Fall,* chaps. xxv. and xxvi.; Tillemont's *Histoire des Empereurs,* V.

VALEN'TIA: Irish island: see VALENCIA.

VALENTINE, n. *văl'ĕn-tīn:* letter containing some pictured representation conveying sentiments of love or burlesque, sent by one person to another on Feb. 14, the day of the festival in the Chh. of Rome in honor of St. *Valentine,* and the day on which birds were popularly supposed to choose their mates; a love-letter: a sweetheart.

VALENTINE, *văl'ĕn-tīn,* BASIL: German alchemist, of whom little is known: 12th c., according to some, but more probably end of the 15th c. It has been stated that he was a monk of the order of St. Benedict, in St. Peter's Convent at Erfurt; but his name does not appear on the list at Erfurt, nor on the general list at Rome. V. was a diligent seeker for the philosopher's stone, and wrote, mostly in the Old Upper Saxon dialect, a number of works, chiefly on the process of transmutation. Lenglet's *History of the Hermetic Philosophy,* III., contains a complete list. Some of the titles are curious—e.g., *Basil Valentine's Twelve Keys of Philosophy, Apocalypsis Chymica, Revelation of the Mystery of the Essential Colors of the Seven Metals, The Triumphal Car of Antimony, A Chemico-philosophical Tract concerning Things Natural and Præternatural,* etc. These were not printed till 1602; later, many were pub. as French translations; a few still remain in MS.

VALENTINE, *văl'ĕn-tīn,* EDWARD VIRGINIUS: sculptor: b. Richmond, Va., 1838, Nov. 12. In boyhood he attended lectures on anatomy in Richmond; he was first stimulated to love of plastic art on visiting the exposition of 1851 at New York. Returning to Richmond, he took lessons in drawing and modelling, and 1859 visited Paris, where he became pupil of Couture. Then he studied his art in Florence under Boaniuti, and in Berlin under Kiss, who was to the young American student not only a master but a warm friend. In Berlin he studied also drawing and the history of art. Returning to Richmond after the war, he exhibited a statuette of Gen. Robert E. Lee. He has executed portrait busts of Gens. Beauregard, J. E. B. Stuart, 'Stonewall' Jackson, Albert Sidney Johnston, and other southern leaders; a reclining figure of Gen. Lee in the chapel of Washington and Lee Univ.—one of the noblest works of monumental sculpture in America; a bronze statue of John C. Breckinridge; a statue of 'Stonewall' Jackson for Lexington, Va.; also several noteworthy ideal and historic figures and groups, among them *Andromache and Astyanax,* his greatest work in that class.

VALENTINE'S DAY, St.: day commemorative of two saints (out of a great number of the same name), formerly observed in England, Scotland, and parts of France, by peculiar and amusing customs in relation to an allotment of young men and young women to each other. In the 15th c. this amusing observance of the day was popular with the upper classes and in vogue at European courts. The imaginary engagements made in sport on that day were supposed to hold good through the year, and often resulted in weddings.—In later times the observance degenerated to the sending of tender or ridiculous love-letters, and was long in usage in the United States. In recent years it has been almost discarded as an absurdity and a nuisance.—The two saints of the early centuries that seem to have had commemoration on the day, were Valentinus, presbyter and martyr (beheaded Feb. 14), and Valentinus of Interamna, bp. and martyr. How the peculiar observance came to be associated with the day of these saints is not known.—See Brand's *Popular Antiquities;* Chambers's *Book of Days*, I.

VALENTINIAN, *văl-ĕn-tĭn'ĭ-an* (Valentinianus, *văl-ĕn-tĭn-ĭ-ā'nŭs*), I., Roman Emperor: 321–375, Nov. 17 (reigned 364–375); b. at Cibalis, Pannonia; son of Gratianus (a rope maker who had enlisted in the army, and risen to the grade of *comes militum*). V. entered the army at an early age, and, aided by the military renown of his father, rapidly rose in rank under Emperors Constantius and Julian; but was degraded by Constantius 357, and, for his publicly expressed contempt for paganism, banished by Julian 362. Restored to favor in the following year, he distinguished himself in the East, and on the death of Jovian was unanimously chosen as his successor 364, Feb. 26. A month after his accession, he chose as his colleague his brother Valens (q.v.), to whom he resigned the govt. of the East, reserving for himself Illyricum, Italy, the Gauls, Britain, Spain, and Africa. During V.'s reign, the utmost vigilance was required to preserve the frontier districts of the empire, now in its decay, from the ravages of the barbarians, who, like vultures, had gathered round their prey. The Alemanni repeatedly (366–368) ravaged the e., and the Saxons (370) the n e., of Gaul; Illyricum was wasted (370) by the Quadi, and Africa by the s. desert tribes. The internal administration was excellent, for the emperor added vigilance and impartiality to his ability, prudence, and firmness; and his cognizance of any abuse or injustice, by whomsoever perpetrated, was the signal for its speedy rectification and the punishment of the offender. Though himself a zealous churchman, he repelled the solicitations of the bishops who wished him to interfere in the religious disputes of the time, permitted his subjects to adopt whatever religion they chose, and strictly forbade all persecution or annoyance on account of religious belief, even maintaining the 'pontifices' of the provinces in the privileges which they had possessed under Julian. On account of the scandalous abuse by ecclesiastics of their influence

over their penitents, he excluded priests and monks from the right of succession to property; judicial proceedings were forbidden to be held in private; the extreme license of speech hitherto allowed to advocates was restrained; gratuitous medical attendance was provided for the poor of Rome; and schools were established throughout the empire. The success of V.'s administration was doubtless due in great part to his fortunate choice of officers: Theodosius the Elder in Africa and Britain, Jovinus in Gaul, and Theodosius the Younger (afterward emperor) in Illyricum, form a trio distinguished by loyalty, administrative ability, and military talent, contrasting strongly with their predecessors in office. V.'s private life was a model of morality and economy; and, according to the summation of the trustworthy Ammianus, 'he had so many good qualities that, if everything had been equal in him, he would have been another Trajan or Marcus Aurelius.' His one fault was an ungovernable temper, which led him into occasional excessive cruelties, and ultimately caused his death. While giving audience to the deputies of the Quadi, with whom he was at war, he worked himself into such a passion as to rupture a blood-vessel in his chest, and he fell back dead in the arms of his guards. By his first wife, he had one son, Gratianus (q.v.); and by the second, Justina, another son, Valentinian, and three daughters, one of whom, Galla, became wife of Emperor Theodosius I.

VALENTIN'IAN (VALENTINIA'NUS) II., Emperor of part of the Western Roman Empire, consisting of Italy, Illyricum, and Africa—his half-brother Gratianus (q.v.) ruling the rest: 372–392, May 15 (reigned 375–392); younger son of Valentinian I. by his second wife, Justina. During his long minority, Empress Justina administered the govt. from Milan. V., who had given promise of good administrative qualities, was murdered by a Frank named Arbogast, whom he had dismissed.

VALENTIN'IAN III., Emperor of the Western Roman Empire: 419–455, Mar. 16 (reigned 425–455); grand-nephew of Valentinian II., and son of Constantius III. by Placidia, daughter of Theodosius the Great and Galla.. V. was a weak and contemptible prince, yet his reign is one of the interesting epochs of Roman history, exhibiting the internal weakness and corruption of the empire, the gradual closing with it of its irresistible barbarian foes; the sad picture lightened from time to time with a flash of the warrior-spirit of old Rome. V. may be said never to have ruled though he sat on the imperial throne for 30 years: his mother, Placidia, governed till her death 450, and was succeeded by the eunuch Heraclius. The regulations enacted for the internal administration were creditable, especially when ecclesiastical interests were involved. But the corruption of manners, the extinction of 'public spirit,' the exactions of the tax-collectors and of the commissioners who were appointed to prevent these exactions, the general employment of the powers of the executive in avenging private quarrels, and the impossibility of obtaining redress for injuries, plainly showed that the empire had fallen beyond

remedy, and that, if not destroyed by assailants from without, it would of itself speedily crumble to pieces. The early part of V.'s reign was disturbed by the contests between the 'comites' Boniface and Aëtius, the former of whom had supported, and the latter resisted, V.'s claims to the throne. Aëtius by his calumnies prevailed on the empress to declare the upright governor of Africa a public enemy; and the latter, in his resentment, called to his aid the Vandals under Genseric (q.v.), and Africa was lost to the empire. Though the Franks, Goths, Burgundians, and other German nations who had encroached on the empire, were successively defeated and repelled by Aëtius, and the destructive career of the formidable Huns brought almost to a close on the field of Chalons, the labor of defending an extensive empire from attack on all sides was too great; consequently much of Spain and Gaul was ultimately seized by the Suevi and Visigoths, n. Italy was ravaged by the Huns, Sicily and Sardinia by the Vandals, and even Rome repeatedly besieged, while Britain was abandoned to the Picts and Scots, and the empire practically dismembered. Aëtius was murdered 454. V., who had ravished the wife of his intimate friend Maximus, was murdered in the following year by friends of Maximus and Aëtius.

VALENTIN'IANS: Gnostic sect or school; followers of Valentinus, native of Egypt, but supposed to have been of Jewish origin, who went from Alexandria to Rome about 138, and there introduced a strange compound of Judaism and Gnosticism. Valentinus is said to have died at Rome (or, according to others, at Cyprus) about 160. He is said to have claimed that his doctrines were received partly from a pupil of the apostle Paul, and partly by direct revelation. He divided the higher spiritual world into 15 pair of æons (see ÆON), each consisting of a male and a female. The first pair, or syzygy, is made up of Bythos, or God in Himself, and Ennoia, or God as existing in His own thoughts; from these emanated Nous (Intelligence) and Aletheia (Truth), and so on. As the last æon, Sophia (Wisdom) transgressed the bounds that had been laid down by the æon Horos, and a part of her being became lost in Chaos, and there was formed a crude being, called Achamoth, which, through the Demiurge (q.v.) that emanated from it, created the corporeal world. Horos now imparted to the souls of men (for all the bodies composing the corporeal world are possessed of souls) a *pneumatic* or spiritual element; but this attained to full activity only when Christ, a collective emanation from all the æons, appeared as Saviour, and united himself with the man Jesus. In the end, all that is pneumatic, and even the originally psychic or soul element in as far as it has assimilated itself to the psychic, will return into the Pleroma (q.v.): see GNOSTICS.

VALENTINITE, n. *văl-ĕn'tĭn-īt* [after Basilius *Valentinus*]: white oxide of antimony, a mineral of a whitish-gray color, found in veins in the primary rocks along with other ores of antimony, lead, and zinc.

VALENZA, *vâ-lĕn'zâ* (*Valentia Valentinum Forum*): city of n. Italy, on an elevated plain, on the right bank of the Po, 8 m. n. of Alessandria. It is very regularly built, and commands a fine view of the surrounding vine-clad hills. It carries on a trade in wine, and manufactures of silk, flax, and hemp fabrics.—Pop. about 7,000.

V., a very ancient town, belonged to the Liguri, and was conquered by Marcus Fulvius, the proconsul, who named it *Forum Fulvii, quod Valentinum.* In 1635 it was besieged for 50 days by the armies of France, Savoy, and Parma, and was taken. In 1707 it came into the possession of Victor Amadeus II., Duke of Savoy; 1805 the French destroyed its gates and fortifications; and 1815, after the fall of Napoleon's empire, it reverted to the king of Sardinia.

VALERIAN, n. *vă-lē'rĭ-ăn* [L. *valērĕ*, to be strong, to be in health]: a plant, most of whose species are very ornamental in flower-borders, and which have stimulant and aromatic qualities; the *Valerĭāna officinālis*, ord. *Valerĭanācĕæ;* the Greek valerian is *Polemōnĭum cærulĕum*, ord. *Polemonĭācĕæ.* VALE'RIAN'IC, a. *-ăn'ĭk*, of or from valerian. VALERIANIC, or VALERIC ACID, an acid which can be extracted from the root of *Valerĭāna officinālis*, the product being neutralized with magnesia. VALERONE, n. *văl'-ĕr-ōn*, a colorless fluid, lighter than water, obtained by the distillation of valerianic acid.

VALE'RIAN: exogenous plant of the genus *Valeriana*, of nat. order *Valerianaceæ*, containing nearly 200 species, natives of temperate climates of Europe, Asia, and America; annual or perennial herbaceous plants with opposite leaves, destitute of stipules, and small flowers in cymes. They are nearly allied to *Dipsacaceæ* (see TEASEL), but differ in mode of inflorescence, and in the seeds being destitute of albumen. The fruit also is not simply 1-celled, but exhibits two other abortive cells; and the stamens are 1–5, the stigmas 1–3. The corolla is sometimes spurred. The Greek Valerian, or Jacob's Ladder, belongs to a different family, *Polemoniaceæ* (q.v.).—The genus *Valeriana* is distinguished by a calyx with pappus-like bristles (unrolled and spreading as the seed matures), a spurless corolla, and three stamens. The species are numerous. The com-

mon V. (*V. officinalis*) is abundant in ditches, moist woods, etc., throughout Europe. It has a fleshy root, pinnatifid leaves, a stem 2–4 ft. high, and pale flesh-colored flowers. The root is a well-known medicine, used as a remedy in spasms, epilepsy, hysteria, and other nervous affections. Cats are very fond of it, and it exercises a remarkable stimulating and intoxicating power over them. Though the plant grows chiefly in damp soils, the root is most powerfully medicinal when grown in dry hilly ground.

The roots should be collected in autumn. The chief ingredients of V. are woody fibre, resinous and gum-like matters, and a little more than 1 per cent. of a volatile oil termed *valerole*, which is crystallizable, and in which *valerianic* or *valeric acid* is developed on exposure to the air. V. imparts its therapeutic properties, which are stimulating and antispasmodic, both to water and to alcohol. There are three officinal preparations—the *Infusion*, the *Tincture*, and the *Ammoniated Tincture*. In large doses V. produces considerable disturbance of the nervous system, as headache, vertigo, and even temporary blindness. In average doses—e.g., one to two ounces of infusion, or half a dram to two drams of either of the tinctures—it is a very efficacious remedy in those severe cases of hysteria which closely simulate epilepsy, and in chorea. As some of the salts of valerianic acid—the valerianates of soda, zinc, ammonia, iron, and quinine—act in the same way as, but with more certainty than, the above named preparations, we may infer that the therapeutic action of the remedy is due solely to the acid. As the infusion and tinctures are not agreeable medicines, they may be replaced by the valerianates.

The Small Marsh V. (*V. dioica*), also native of Europe, is much less powerful than the common species.—The greater V. (*V. Phu*), which grows in alpine districts of the continent of Europe, is now almost disused, though it is said to be one of the strongest of the European Valerians—a pre-eminence which *V. Dioscoridis* disputes with it. A common name of it is Garden V., applied also to the Red V. (*V. rubra*).—*V. Celtica* and *V. Saluinca* are gathered near the limits of perpetual snow on the mountains of Styria and Carinthia, and carried into Turkey and Egypt, and thence into India and Ethiopia, to be used to aromatize baths, and as a substitute for Spikenard (q.v.). —*V. Sitchensis*, a native of n.w. America, is said to possess the medicinal properties of the genus in great perfection. Other N. Amer. species are *V. paucifolia*, with heart-shaped root-leaves and pale pink corolla ½ in. long, found from Penn. to Ill. and s.; and *V. sylvatica*, with ovate or oblong root-leaves, not toothed, occurring in cedar-swamps from Vt. to Wis. and n., and probably a form of *V. dioica*. The root of *V edulis*, an article of food of the Indians, is spindle-shaped, large, and 6–12 in. long; when baked on heated stones under earth, it is not a disagreeable food. It is found from O. to Wis. and w. *V. Hardwickii* is used medicinally in Nepaul.—Corn Salad (q.v.) or Lamb's Lettuce belongs to the order *Valerianaceæ*.

VALERIANEL'LA: see CORN SALAD.

VALERIANUS, *va-lē-rĭ-ā'nŭs*, PUBLIUS LICINIUS, Roman Emperor: reigned 253–260; of ancient and noble family, and mentioned first 238 as *princeps senatus*. After distinguishing himself in various posts, he was chosen for his integrity and accomplishments to the office of censor about 251. Faithful in his allegiance to Gallus, he went to summon the legions of Gaul and Germany to aid the feeble emperor against the usurper Æmilianus, but arrived too late to save his master. The usurper's troops, awed by the superior numbers of V.'s army and the stern sanctity of their leader's character, murdered their own chief, and united with their late antagonists in proclaiming V. emperor 253. V. was then about 60 years of age, and, feeling his inability to sustain, unaided, the cares of empire, assumed as colleague his eldest son, Gallienus (q.v.). V. during his short reign showed ardent zeal for the prosperity of the empire; but the times required a ruler of more energy and ability to deal with the grave disturbances which arose throughout the empire—the irresistible irruption of the Franks into Gaul, despite the utmost efforts of Aurelian (q.v.), the devastation of Thrace, Macedonia, Greece, and of the Archipelago by the Goths, the advance of the Alemanni to Milan, and the conquest of Syria and Armenia by Shapur. The troubles in the East appearing most threatening, V. went thither in person, and for some time was successful; but, pursuing his opponents too rashly, he was suddenly attacked by superior numbers at Edessa, completely defeated, and forced to surrender 260. His fate is unknown; but it is said that many indignities were heaped on the unfortunate captive by his haughty conqueror; that he languished till death in hopeless captivity; and that after his death his skin was flayed off and stuffed and preserved as a trophy.

VALERIC, *vā-lĕr'ĭk* or *văl'ĕr-* (or VALERIAN'IC), ACID: one of the volatile fatty acids represented by the general formula $C_5H_{10}O_2$. There are four metamorphic forms of V. A.—viz., $C_4H_9.COOH$, normal V. A. or propyl-acetic acid; $C_5H_{10}O_2$, isovaleric or ordinary V. A.; CH.COOH, secondary V. A.; $(CH_3)_3C.COOH$, tertiary V. A. Ordinary V. A., $C_5H_{10}O_2$, is a thin, mobile, colorless oil, with persistent and characteristic odor of valerian root; it has a sharp and acid taste, reddens litmus strongly, bleaches the tongue, and when fired burns with bright yet smoky light; it boils at 347° F. V. A. exists in valerian root (see VALERIAN), and is obtained by distilling the root with water acidulated with sulphuric acid. It may be similarly obtained from angelica root and some other vegetable sources. It is best obtained by oxidation of amyl alcohol with a mixture of sulphuric acid and potassium dichromate.

The metallic salts of isovaleric or ordinary V. A. are greasy to the touch, and mostly crystallize with difficulty: their general formula is $C_5H_9O_2M$—the M representing the metal—e.g., silver isovalerate, $C_5H_9O_2Ag$; zinc isovalerate.

$(C_5H_9O_2)_2$ Zn. The other metamorphic forms give like compounds.

The sodium and zinc salts of ordinary V. A. are used in medicine; also the isovalerates of ammonium, iron, and quinia.

VALERIUS MAXIMUS, *vā-lē'rĭ-ŭs măks'ĭ-mŭs:* anecdotist, who appears to have lived in the 1st c. His work *Dicta Factaque Memorabilia* (9 books) has come down to our time substantially complete. In the middle ages V. M. possessed high authority, and not without reason, for he has preserved many authentic anecdotes of ancient worthies which else would have gone into oblivion. His style, though ornate, is chaste and vigorous. Before 1490 fourteen editions of V. M. were given out from the press He was translated into English by W. Speed, 1678.

VALET, n. *văl'ĕt* or *văl'ā* [F. *valet,* a servant, a valet—from OF. *vaslet* or *varlet,* a squire, a youth who served under a lord—a dim. of *vassal,* a vassal—from Bret. *gwaz;* W. *gwas,* a youth, a servant]: a male servant who attends on a gentleman's person; a body-servant; a waiting-servant. VALET DE CHAMBRE [F. *de,* of; *chambre,* a chamber]: a personal attendant.

VALETTA, *vâ-lĕt'tâ,* or VALLETTA, *vâl-lĕt'tâ:* important fortress and beautiful city, cap. of the island of Malta; on the n.e. side of the island, lat. 35° 53′ n., long. 14° 31′ e. It occupies a tongue of land extending n.e. 9,600 ft., and generally about 3,600 ft. across, except at the extremity, where it narrows considerably and forms the famous Point of St. Elmo, on which are a powerful fort and a light-house. From this Point to its landward end, the neck of land, named the 'Hog's Back,' rises gradually; and there is a downward slope from the central ridge to the Great Harbor on the right, and to the Marsa-Musceit, the quarantine harbor, on the left. Eight principal streets traverse the peninsula, and are intersected by cross streets that pass over the central ridge, and afford communication from harbor to harbor. These cross-streets are necessarily very steep at the extremities, where they rise from the shores by long flights of stairs. The town and harbors are defended by a series of fortifications of great strength. They are mostly hewn out of the solid rock, and, mounted with the most powerful artillery, are considered impregnable. The city is divided into five parts —the *Citta Nuova,* or V. proper, Floriana, Vittoriosa, Sanglea, and Barmola. Besides the enormous forts, balconies, and battlements, which are the principal architectural characteristics of the city, V. contains many noble edifices. The governor's palace—formerly that of the grand masters of the order of St. John—is plain without, but magnificent within, and possesses an interesting armory; the Cathedral of St. John is a superb structure; and the Church of San Pubblio, with its famed *sotteraneo* (vault) of embalmed monks and skeletons; the public library, 60,000 vols.; the university; and the aqueduct, which brings water to the city 8¾ m. from the far side of

the island, are noteworthy. The city was founded 1566 by the grand master Valette (q.v.)—from whom it derives its name. V. is the centre of the commerce of the island, for which, as well as for the principal historical incidents with which its name is associated, see MALTA.—Pop. (1881) 24,854; (1888) estimated 26,700.

VALETTE, *vâ-lĕt'*, JOHN PARISOT DE LA, *dĕh lâ pâ-re-zō':* grand master of the Knights of St. John, celebrated for his gallant defense of Malta against a powerful fleet of the Turks, by which he greatly aided in checking the westward progress of the arms of Solyman the Great, long the terror of Europe and of Christendom: 1494–1568, Aug. 21; of noble family. At a very early age he entered the order of St. John of Jerusalem (q.v.), in which he soon distinguished himself by enthusiastic bravery and skill in arms. His chief distinctions, even in youth, were won in the naval service in the Mediterranean, where the Turkish power was especially formidable. On the death of Claude la Sangle, grand master of the order, La V. was elected to that office, 48th in the list of the grand masters. Still directing the energies of the order in the same course, he succeeded, within the first five years of his grand-mastership, in capturing 50 great galleys from the Turks, and an immense number of smaller vessels of war; which stirred the sultan to attempt the capture of Malta and the destruction of the knights. Accordingly, 1565, May 18, an immense fleet of 159 ships, conveying 30,000 janizaries and spahis, appeared off the harbor of Malta, and, after failing in several assaults, formally invested the island. Alone and unsupported by any of the Christian powers, the gallant La V. held the fortress under circumstances of extreme difficulty and distress of every kind: and when, all further resistance seeming hopeless, he was urged to capitulate, his reply was, that the life of a worn-out soldier of 71 years could not be better spent than in such a service. At last, at the end of four months, and after a loss, it is said, of 20,000 men, the Turkish fleet was forced to raise the blockade and retire. La V. died three years later.

Another LA VALETTE, a father of the Jesuit Soc., obtained notoriety in the latter half of the 18th c. Having engaged, contrary to the prohibition of Benedict XIV., as a trader in the products of the large estates held by the Jesuits in the Philippine Islands, and being unable, in consequence of the capture of his ships by an English privateer, to meet his engagements, a suit was commenced in the French courts against the French province of the soc., the proceedings in which suit were among the causes which precipitated the expulsion of the soc. from France, and its eventual suppression by Clement XIV.: see JESUITS.

VALETUDINARIAN, n. *văl'ĕ-tū'dĭ-nā'rĭ-ăn* [L. *valetudĭnārĭus*, one in ill health—from *valetūdo*, state of health—from *valērĕ*, to be well: It. *valetudinario:* F. *valétudinaire*]: a person of weak or sickly constitution: ADJ. sickly; seeking to recover health. VAL'ETU'DINA'RIANISM, n. *-ĭzm*, state of being a valetudinarian; ill health. VAL'ETU'DINARY, n. a. *-dĭ-nĕr-ĭ*, valetudinarian.

VALGUARNERA, *vâl-gwâr-nā'rd:* town of Sicily, province of Caltanisetta; 48 m. n.e. of Girgenti, in a mountainous district.—Pop. about 9,500.

VALGUS, *văl'gŭs:* in surgery, a variety of Club-foot (q.v.). The word is Latin and signifies 'having legs bent outward, bow-legged,' probably from *volvo*, 'to turn or twist.' As it is an adjective, the substantive *Talipes* (an unclassical word, meaning 'weakness of the feet,' but in surgical use 'club-foot') must be understood.

VALHALLA, n. *văl-hăl'lă* [Icel. *valhöll*, hall of the slain —from *valr*, slaughter, and *höll*, a hall]: in *Scand. myth.*, literally, 'the Hall of the Slain,' the palace or hall of immortality inhabited by the souls of heroes slain in battle: see WALHALLA: WALKYRIES.

VALIANT, a. *văl'yănt* [F. *vaillant*, courageous; *valoir*, to be worth—from L. *valērĕ*, to be strong]: brave; courageous; intrepid in danger; heroic; bravely performed. VAL'IANTLY, ad. *-lĭ*. VAL'IANTNESS, n. *-yănt-nĕs*, valor. VALIANCE, n. *văl yăns*, or VAL'IANCY, n. *-ĭ*, in *OE.*, valor; personal bravery; fierceness. VALIANTS, n. plu. *văl'yănts*, in *OE.*, strong men; valiant men; heroes.

VALID, a. *văl'ĭd* [F. *valide*—from L. *valĭdus*, strong, stout—from *valērĕ*, to be strong: It. *valido*]: founded in truth; not weak or defective; efficacious; having legal force; just; sound; executed with the proper formalities; in *OE.*, strong; powerful. VAL'IDLY, ad. *-lĭ*. VAL'IDNESS, n. *-nĕs*, validity. VALIDITY, n. *vă-lĭd'ĭ-tĭ*, soundness; legal strength or force; in *OE.*, strength; value. VALIDATE, v. *văl'ĭ-dāt*, to make valid or sound; to acknowledge as true.—SYN. of 'valid': available; efficacious; good; weighty; just; sufficient.

VALISE, n. *vă-lēs'* [F. *valise*—from It. *valigia:* origin unknown]: a leather receptacle for the clothes, toilet articles, etc., of a traveller; travelling-bag; portmanteau; saddle-bag used by horse-artillery.

VALKYR, n. *văl'kĭr*, or VALKYR'IA, n. *-ĭ-a* [Icel. *valkyrja*—from *valkr*, the slain]: in *Scandinavian Mythology* (q.v.), one of the 12 nymphs of Valhalla: see WALKYRIES: WALHALLA.

VALLA, *vâl'lâ*, LAURENTIUS: one of the first scholars of the Renaissance: about 1406–57; b. Rome. He taught classics in n. Italy; but his assaults on the scholastic philosophy, and his defense of Epicurus, made it necessary for him to seek protection at Naples from Alfonso V., 1443. Here he soon fell under suspicion of heresy, and was, it is said, dragged for punishment before the Inquisition. Aided by the king, he escaped to Rome, where Pope Nicholas V. pardoned him, received him into favor, and appointed him papal sec. and canon in the Church of St. John Lateran. V.'s Latin translations of Herodotus (Par. 1510) and Thucydides (Lyon 1543) are admirable, and did much to spread a knowledge of history; but his most renowned work was *Elegantiæ Latini Sermonis* (6 books, Rome 1471), long a model in style to Latinists: 59 eds. of it

appeared 1471–1536. It has passages of noble eloquence in praise of the glorious tongue of Rome, through which gleams a passionate desire for the unity of Italy. The *Elegantiæ* is full of nice grammatical observations, particularly on synonyms. V. has the credit also of being the first of the Renaissance scholars that used his classical culture in the New Test. criticism (*Annotationes in Novum Testamentum*, pub. by Erasmus). In his *De Donatione Constantini Magni*, he demonstrated the historical groundlessness of the pretended 'Donation' of Constantine, and inveighed against the popes for grasping after temporal power; but this he was forced to retract. A collected ed. of V.'s works appeared at Basel 1543.

VALLADOLID, *vâl-la dō-lĭd'* Sp. *vâl-yâ-thō-lēth'*; former name of a town in Mexico, cap. of the state of Michoacan, and now called MORELIA (q.v.).

VALLADOLID: town in Mexico, state of Yucatan; 90 m. e.s.e. of Merida, in a highly cultivated district. It is the best-constructed and most healthful town in Yucatan, and the seat of cotton manufactures. Pop. about 18,470.

VALLADOLID: city of Spain: formerly cap. of the whole country, now cap. of the province of V. (see CASTILE); on a wide, windy plain on the left bank of the Pisuerga, 150 m. n.w. of Madrid by railway. It is 2,250 ft. above sea-level, and has a healthful climate, the air being pure and genial, and the sky generally cloudless. Having been the residence of the court prior to its removal to Madrid at the close of the 16th c., the city contains many large and decayed dwellings; though, with returning prosperity, new mansions have been erected, and the streets paved, enlarged, and multiplied. In the Plaza de Campo, site of famous tournaments, *autos-da fé*, decapitations, and bull-fights, Napoleon reviewed 35,000 troops. The Plaza de Toros, or bull-arena, can accommodate 10,000 persons. The Museo, which contains such of the statues, carvings, and sculptures as could be collected at the suppression of convents in the province, is an elegant building, containing a grand saloon, six rooms filled with pictures, and three with sculptures. Of these treasures, the sculptures are the most valuable, though among the pictures are several by Rubens. Near the Palacio Real (royal palace) are the remains of two of the noblest Gothic religious edifices in the world, the Convent of San Pablo and the Colegio de San Gregorio, both richly and beautifully decorated, but much damaged by the French soldiery. V. is admirably situated for trade and manufactures. There is abundant water for irrigation, and the surrounding district is remarkably fertile. It communicates with the Atlantic by the Douro river, and with middle and s. Spain by canals and railways. Manufactures are springing up in the city: and the soil in the vicinity is being improved. Silk, cotton, and woolen stuffs, jewelry, hats, paper, perfumery, etc., are manufactured.—Pop. (1900) 68,790.

V., the *Pincia* of Ptolemy, is mentioned under its present name first in 1072. Charles V. erected many splendid

edifices here. About that time, V. was the most prosperous city in Spain, containing 100,000 inhabitants: formerly cap. of Castile and Leon, it was still the residence of the kings and the usual resort of foreigners. From 1560, when Madrid was declared the only court, V. declined. Since 1851 it has been the seat of an abp., and has still its university.

VALLADOLID' LA NUE'VA (city in Honduras): see COMAYAGUA.

VALLARY CROWN, *văl'lâ-rĭ* [L. *corona vallaris* or *castrensis*]: crown in the form of a circle of gold, with palisades attached, bestowed by the anc. Romans on the soldier who first surmounted hostile outworks and broke into the enemy's camp. It is occasionally used as a heraldic bearing.

VALLATION, n. *văl-lā'shŭn* [L. *vallum*, a rampart]: in *OE.*, a rampart or intrenchment.

VALLECULA, n. *văl-lĕk'ū-la* [dim. of L. *vallis*, a valley]: in *bot.*, a depressed space or interval between the ribs on the fruit of Umbelliferæ.

VALLEJO, *văl-lā'hō:* city and seaport in Solano co., Cal.; on San Pablo Bay, at the mouth of Napa creek, and on the Central Pacific railroad; 27 m. n.n.e. of San Francisco. It has a commodious, safe, and accessible harbor, capable of receiving the largest vessels, and is directly opposite the U. S. navy-yard at Mare Island. The region is agricultural, and the city exports large quantities of grain. Other industries are the manufactures of flour, steam-engines, boilers, foundry products, brooms, and ship-building. In 1901 there were gas and electric light plants, water-works, street railroad, 11 churches, high school, several grammar schools, acad. for young ladies, convent, orphan asylum, 1 state bank (cap. $95,000), and 2 daily and 2 weekly newspapers.—Pop. (1880) 5,987; (1890) 6,343; (1900) 7,965.

VALLEY, n. *văl'lĭ*, VAL'LEYS, n. plu. *-lĭz* [F. *vallée*—from L. *vallis*, a valley: It. *valle*]: a tract of land of greater or less breadth lying between a range of hills or mountains; a low plain through which a river flows: in *arch.*, the gutter or internal angle formed by the two inclined sides of a roof. VALE, n. *vāl*, a poetic form of *valley*. —*Valleys* are generally parallel to the direction of the ridges of elevated ground; but some valleys are transverse, cutting through the mountain chain. They have a water-course at or near their lowest level. Through the main V. flows the river of the drainage-system to which it belongs, while the tributary streams flow to this river through lateral valleys. The terms upper and lower V. define parts of the same V., as related to the source or to the mouth of its river. In wide valleys, especially those in which the waters are largely charged with sediment, the river often builds up a channel for itself, higher than the ground at the foot of the hills: the Rhine, the Nile, and almost all great rivers in wide valleys, illustrate this. The river flows seldom through the middle of the V., but generally

nearest that side where the slope to the high ground is steepest; the opposite side of the main V., presenting a more gradual rise to the mountain summits, supplies the chief lateral valleys and tributary streams.

Internal force must have been a principal agent in producing the diversity of hill and valley: it acted by raising the surface perpendicularly from below; by producing great faults, which presented facilities for the action of running water; or by pushing a portion of the crust forward, so as to produce immense folds, alternating with mountain ranges. The Appalachians of N. America, and their associated valleys, have been produced, as shown by Prof. Rogers, by the last-mentioned method. In other cases, valleys have been produced by the plowing of glaciers in the glacial period, or by atmospheric erosion acting on soft material. In the case of river-cuts through mountains, the adjacent region was filled with strata (afterward removed) when the process of cutting by the river began; and in some instances there was an elevation that kept pace with the work of cutting, the river acting as a saw on material pressed upward.

VALLEY FORGE, *văl'lĭ fōrj:* village in Schuylkill tp., Chester co., Penn.; on the Schuylkill river, and the Philadelphia and Reading railroad; about 24 m. n. w. of Philadelphia. It is famous in U. S. history as the scene of much suffering from cold and privations by Washington's army, which was in winter quarters here 1777. The site of the encampment is a state park.

VALLIC'ULA: see VALLECULA.

VALLISNERIA, *văl-ĭs-nē'rĭ-â:* genus of small, stemless, aquatic plants, with grass-like leaves, belonging to the nat. order *Hydrocharideæ,* found in the warm parts of both hemispheres, and generally growing in running waters. *V. spiralis* is particularly notable for its peculiar process of fecundation. When this is about to take place, the flowers of the female plants rise to the surface of the water by means of their long spirally twisted stalks: the flowers of the male plants, which grow on short spikes at the bottom of the water, in order to follow them thither, become detached, expand, and float about on the surface. After fecundation, the female flowers return under water by the spiral contraction of their stalks, and the fruit is ripened under water. This plant is found in ditches and ponds in Europe and America. It is one of the plants used under the microscope to exhibit rotation (cyclosis) of protoplasm in the living vegetable cell.

VALLOMBROSA, *văl-om-brō'sâ* ('Shady Valley'): celebrated abbey of Tuscany; among the Apennines, 15 m. e. of Florence, in a valley surrounded with forests of fir, beech, and chestnut trees (hence the name). Here an order of monks following the rule of St. Benedict was founded by John Gualbert 1039. They were called Vallombrosians, from the name of the site, or Gray Monks, from the color of their habit, which, however, was afterward changed to black. They were the first to admit lay brethren. The monastery became very wealthy through dona-

tions. The present magnificent buildings, erected 1639, are now used for a royal acad. of forestry, the monastery having been suppressed 1863. This picturesque scene was visited by Dante, was celebrated by Ariosto in the *Orlando Furioso*, canto xxii., and is mentioned by Milton in the *Paradise Lost*. It is still much visited by artists and tourists.

VALLS, *vâls:* old-fashioned town of Spain, province of Tarragona; in a plain watered by the Francoli, 55 m. w. of Barcelona. V. is surrounded by ancient walls. It has manufactures of cotton, woolen, silk, leather, and soap. The French, under St. Cyr, defeated the Spanish here 1809; but were in their turn defeated 1811.—Pop. about 13,500.

VALMY, *vâl-mē':* village of France, dept. of Marne; 20 m. n.e. from Chalons. In 1792 the Prussians, under the Duke of Brunswick, after capturing Longwy and Verdun, were advancing toward Paris, driving the army of Dumouriez before them, when Kellermann (q.v.), who commanded the army of the Rhine, learning the critical situation of his comrade, hastened to his relief with 22,000 men, and, taking position on the heights of V., awaited the advance of the Prussians. These, possessing themselves of the heights of La Lune, immediately opened a vigorous cannonade on the French, to which the latter effectively replied. The explosion of two ammunition-wagons within the French lines having thrown them into disorder, a body of Prussians advanced to the attack; but the energetic conduct of Kellermann, and the enthusiasm infused by him into his troops, restored their steadiness, and, by a sudden charge with the bayonet, the Prussians were driven back to their former position. This battle, or rather skirmish, frequently alluded to as the *cannonade of Valmy*, did not cost either army more than 800 men, but it produced moral effects of great importance. It was the first triumph of the republican arms, and the French, with characteristic impulsiveness, were raised from the depths of despair to the pinnacle of self-confidence. When Napoleon was creating his 'noblesse,' this great service rendered to France by Kellermann was fitly remembered by his nomination as *Duc de Valmy*.

VALOIS, *vâ-lwâ'*, House of: branch of the Capetian Dynasty (q.v.), which possessed the throne of France 1327–1589. It originated in the person of Charles, second son of King Philippe III. (*le Hardi*), who obtained 1285 the county of V. in appanage from his father. Previously the county had been possessed by a cadet branch of the great House of Vermandois; but after the union of the heiress of Vermandois with Count Hugh the Great, younger son of King Henry I., and on the failure of their descendants in the end of the 12th c., the Vermandois possessions, including V., were annexed to the French crown, till again separated 1285, as above mentioned. But Philippe IV., elder brother of Charles, having left three sons, who reigned in succession and died without issue male, the suc-

cession fell, by the Salic law, to the eldest son of Charles, who accordingly ascended the throne as PHILIPPE VI. (q.v.). The elevation of the House of V. to the throne of France gave rise to long and bloody wars with Edward III. of England, who claimed the crown through his mother, Isabel, daughter of Philippe IV., insisting that the Salic law prohibited only the 'succession' of females, and did not deny their capacity for transmitting a claim to the crown. But if Edward III.'s argument had been sound, it would have destroyed his rival's claim without benefiting himself, for the real heirs to the throne would have then been the Navarrese royal family, as descendants from the eldest daughter of Louis X. Edward, nevertheless, assumed the title *King of France* (an example followed by all his successors till George III.), and maintained his claim by force of arms till, by mediation of the pope, a partition of the kingdom was effected. The French crown fell, by regular succession of son to father, to JOHN THE GOOD (reigned 1350–64), CHARLES V. (1364–80), CHARLES VI. (1380–1422), CHARLES VII. (1422–61), LOUIS XI. (1461–83), and CHARLES VIII. (1483–98), under the first four of whom the contest with England was carried on with spirit, at first to the advantage of the English, but latterly of the French, who, under Charles VII., drove the English from all their strongholds except Calais. Charles VIII. having died without male issue, the crown fell to the representative of the nearest collateral male line—i.e., to Louis, son of Charles, Duke of Orleans, and grandson of Louis, Duke of Orleans, the younger brother of Charles VI., who ascended the throne as LOUIS XII. (1498–1515), the first of the Valois-Orleans *régime;* but he also dying without male issue, the succession devolved on the descendants of his uncle, Count Jean of Angoulême, whose grandson, FRANCIS I. (1515–47), next obtained the sceptre, which he transmitted to his son, HENRY II. (1547–59). Henry's three sons, FRANCIS II. (1559–60), CHARLES IX. (1560–74), and HENRY III. (1574–89), occupied the throne in succession; but none of them leaving lawful male heirs, and all the collateral male lines proceeding from Philippe III. having become extinct, the crown passed to the House of Bourbon (q.v.), descendants of Philippe's younger brother, Robert.

The most distinguished cadet branches of the royal line of V. were: the ducal family of Anjou, which long contested with the Aragonese royal family the possession of Naples; the last and most celebrated ducal House of Burgundy; and the illegitimate line of Dunois and Longueville, productive of eminent warriors and daring politicians.

The V. monarchs of the elder line were a succession of able rulers, who, by valor and policy, wrested France from the hands of the English, and firmly established the royal authority over their powerful, proud, and turbulent nobility; those of the younger, or *Valois-Orleans* and *Valois-Orleans-Angoulême* lines were, except Francis I., a series of weak princes, under whose feeble rule the country was distracted by contests for power between rival nobles, and

religious dissensions among the people at large, though, owing to the number of able men on whom devolved the cares of govt., the country suffered less than might have been expected from the incapacity of its monarchs.

VALONIA, n. *vă-lō'nĭ-ă* [It. *vallonea*—from mod. Gr. *balanĭa*, the holm or scarlet oak—from Gr. *balănos*, an acorn]: the acorn-cups of an oak growing in Turkey, Greece, and other countries bordering on the Levant, much used by dyers and tanners, from the abundance of tannin which it contains; the acorn of the *Quercus æ'gilops*, ord. *Cupulif'ĕræ*.

VALOR, n. *văl'ĕr* [F. *valeur*, value, valor—from mid. L. *valor* or *valōrem*, activity, warlike valor—from L. *valērĕ*, to be strong: It. *valore*, value, bravery]: that quality of mind which enables a person to encounter danger with firmness and resolution; personal bravery; courage. VAL'OROUS, a. *-ŭs*, brave; courageous; stout-hearted. VAL'OROUSLY, ad. *-lĭ*.—SYN. of 'valor': heroism; bravery; gallantry; intrepidity; prowess; fearlessness; boldness.

VALOREM, used only in the phrase AD VALOREM, *ăd vă-lō'rĕm* [L. *ad*, to; mid. L. *valōrem*, profits received from goods, value]: according to the value; in *commerce*, applied to customs duties levied on the value of the dutiable commodity—as distinguished from *specific duties*, levied as so much per piece, yard, lb., barrel, ton, or the like.

VALPARAISO, *vâl-pâ-rī'sō:* city, cap. of Porter co., Ind.; on the Chicago and Grand Trunk, the New York Chicago and St. Louis, and the Pittsburgh Fort Wayne and Chicago railroads; 44 m. s.e of Chicago. It is in an agricultural region, and contains co. court-house, Northern Indiana Normal School, 8 churches, graded public schools, St. Paul's Acad. (Rom. Cath.), 2 national banks, and 3 daily, 4 weekly, and 1 bi-weekly newspapers. The manufactures include agricultural implements, paper, pins, carriages and wagons, foundry and machine-shop products. Pop. (1880) 4,461; (1890) 5,090; (1900) 6,280.

VALPARAISO: province of Chili, bounded n. by Aconcagua, e. and s. by Santiago, w. by the Pacific; 1,670 sq. m. It is divided into four departments, named after the chief town in each—viz., Valparaiso, Quillota, Limache, and Casa Blanca.—Pop. about 230,000.

VALPARAI'SO: city of Chili, S. America; cap. of the prov. of V.; about 70 m. w.n.w. of Santiago (q.v.), but 115 by rail; lat. 33° 0′ 2″ s., long. 71° 41′ 15″ w. It is on a narrow strip of land, at the head of the Bay of V. It contains theatres, colleges, hospitals, and a number of scientific and literary institutions; its streets, though narrow, are well paved; and its houses, generally two stories high, are gayly painted, and furnished with balconies. V. is the most important trading town of Chili, and one of the principal commercial ports on the w. coast of S. America. It has a growing commerce. The Bay of V., which is generally thronged with ships, is sheltered from all quarters except the n.; and in the winter months, when n. gales prevail, the anchorage is considered dangerous. In 1822 the town

was nearly destroyed by an earthquake; and its progress has since been repeatedly checked by the same cause. Fifteen forts, mostly new, defend the bay. More than 1,500 vessels enter the port annually. Foreign trade is chiefly with Great Britain, France, Germany, and the U. S. Imports, value about $17,000,000, are chiefly cotton, silk, and woolen goods, hardware, iron, sugar, wines, spirits, tobacco, etc.; exports, value about $9,000,000, are chiefly copper and copper ore, silver, gold, wheat, flour, tallow, hides, and wool. V. was bombarded by the Spanish fleet 1866, Mar. 31. Few lives were lost, but a large part of the town was laid in ruins—the damage being estimated at more than $10,000,000. In the revolution against Pres. Balmaceda 1891, severe fighting occurred before V. Aug. 21–23, in which the revolutionists were successful. The city was occupied the 28th, and the pres. fled Aug. 31. A mob which started fires and rioting was soon suppressed. On Oct. 16 an attack was made by Chilians on a number of sailors from the U. S. warship *Baltimore* on shore leave, in which several sailors were killed and many wounded. The incident produced great excitement in the United States. The govt. made prompt demand for reparation, and began energetic naval preparations to enforce the demand. War was averted by Chili making an ample apology to the United States 1892, January.

Pop. of V. (1825) 10,000; (1885)105,000, of whom about 10,000 were foreigners; (1890) 150,000; (1901) 132,940.

VALTELLINA, *vâl-tĕl-lē'nâ:* valley of Lombardy, bounded n. by the Grisons, n.e. by Tyrol, s. by the provinces Brescia, Bergamo, Como, w. by Lake Como: it is now the province of Sondrio (1,261 sq. m.) in the *compartimento* of Lombardy. It is a very fertile region, producing wine, grain, fruits, and cheese. The cap. of the province is Sondrio; other towns are Teglio, Tiramo, Chiavenna, Bormio, Grosotto.

VALUE, n. *văl'ū* [OF. *value,* value—from F. *valoir,* to be worth—from L. *valērĕ,* to be strong, to be worth]: worth as estimated by some rate or standard; that property of a thing which renders it useful or desirable; excellence; usefulness; price; import; efficacy in producing results; in *OE.,* valor: V. to rate or estimate at a certain price; to have in high esteem; to prize; in *OE.,* to be worth, to be equal in worth to. VAL'UING, imp. VAL'UED, pp. *-ūd;* ADJ. estimated at a certain rate; highly esteemed. VAL'UABLE, a. *-ū-ă-bl,* having value or worth; precious; costly: N. anything precious or costly—used in plural. VAL'UABLENESS, n. *-bl-nĕs,* the quality of being valuable. VAL'UA'TION, n. *-ā'shŭn,* the act of setting a price; value set upon a thing; estimation. VAL'UATOR, n. *-ā-tĕr,* one whose occupation is to set the value or worth on a thing; an appraiser; also VAL'UER, n. *-ĕr.* VAL'UELESS, a. *-lĕs,* having no worth.—SYN. of 'value, v.': to compute; rate; esteem; regard; respect; appraise; appreciate; estimate.—*Value* in political economy is the amount of other commodities, usually represented by the current money of the place, for which a thing can be exchanged in open

market. This is called 'value in exchange,' as distinguished from mere 'utility' or 'usefulness,' usually styled 'value in use.' Value in exchange is determined by utility or usefulness—the capacity of satisfying a desire or of serving some purpose; it is determined also by scarcity, difficulty of attainment, labor or skill employed in producing the commodity, etc.

Cost has nothing to do with value. If a bale of silk has cost $500, and from disease in the silk-worm, or other causes, the price of the commodity rises so that it will bring $750, that is its value. So also if there be a fall so that it will only bring $300, that is its value. Vain endeavors have been made to establish a permanent standard of value for the purpose of comparing with each other the conditions of people living at long intervals. As the changes which affect one thing affect all others, comparisons resolve themselves into the nature of fluxions. Money, so effective in estimating contemporary values, is quite useless here. In certain periods, grain, as the necessary of life, has been used as a standard of value. It may be an approximate standard while a people are so poor as to possess little more than the necessaries of life; but when a country becomes so rich that these are but a proportion of the wealth to be estimated, their capacity as a standard is gone.

VALVE, n. *vălv* [F. *valve*, a valve—from L. *valvæ*, folding-doors—allied to *volvo*, I roll]: a cover or lid opening in one direction and shutting in another; a self-acting device used in a pipe, tube, passage-way, inlet, or outlet, to control the flow of a fluid, a gas, or the like—e.g., the *valves* of the heart, the *valve* of a pump, of an organ, etc. (see STEAM-ENGINE); in *bot.*, one of the pieces into which a pericarp or fruit separates, when separating naturally; in *anat.*, a partition which allows a fluid to pass in one direction only; in *OE.*, one of the leaves of a folding-door. VALVATE, a. *văl'vāt*, in *bot.*, opening by valves, like the parts of certain seed-vessels which separate at the edges of the carpels. VALVATE ÆSTIVATION or VERNATION, in *bot.*, terms used when the leaves in the flower-bud and leaf-bud are applied to each other by their margins only. VALVED, a. *vălvd*, having valves; composed of valves. VALVULAR, a. *văl'vū-lĕr*, containing valves. VAL'VULE, n. *-vūl*, a little valve. SAFETY-VALVE: see under SAFE.

VAMBÉRY, *vâm'bā-re*, ARMINIUS: traveller and philologist: b. in Hungary, 1832. He fled from his country after the revolution of 1848, and went to Constantinople, where he applied himself to studying oriental languages. In 1861–64 he travelled in the disguise of a dervish, by routes unknown to Europeans, through the deserts of the Oxus to Khiva, and thence by Bokhara to Samarkand. His position precluded him from making instrumental observations for purposes of geography, but was eminently favorable to an insight into the customs and language of the peoples; hence his *Travels and Adventures in Central Asia* (London 1864) is a very valuable work. His other publications are: *Wanderings and Adventures in Persia* (1867):

Sketches of Central Asia (1868); *History of Bokhara* (1873); *Central Asia* (1874); *The Origin of the Magyars* (1882); *V.: His Life and Adventures* (1883); and *The Coming Struggle for India* (1885). V. is oriental prof. at Pesth.

VAMBRACE, n. *văm'brās* [F. *avant*, before; *bras*, arm]: a piece of plate-armor worn for the protection of the fore-arm. VAMPLATE, n. *văm'plāt*, or VAM'PLET, n. *-plĕt* [F. *avant*, before; *plat*, a plate]: a projecting piece of iron through which the handle of a lance passed, and which served to protect the arm and hand when the lance was couched as in jousting.

VAMP, n. *văm̆p* [OE. *vampey*, a corruption of F. *avant-pied*, the forepart of the foot—from *avant*, before; *pied*, the foot]: the upper leather of a shoe: anything added to give an old thing a new appearance: V. to put a new upper leather on; to furbish, generally with *up;* in *music*, to play an accompaniment on any instr. off-hand or in a rough-and-ready way: N. a rough accompaniment on an instr. improvised for the occasion. VAMP'ER, n. *-ĕr*, one who pieces out an old thing with some new part.

VAMPIRE, n. *văm'pīr* [F. *vampire;* It. *vampiro;* Ger. *vampyr*, a vampire: Serv. *wampir*, *wampira*, a vampire]: an imaginary demon, said to be a person who after death returns nightly to suck the blood of the living while they are asleep; hence, one who lives by preying on others; an extortioner; a species of S. Amer. bat, the Vampire-bat (q.v.). VAM'PIRISM, n. *-pir-ĭzm*, the actions of a vampire; the practice of blood-sucking or extortion; belief in vampires.—*Vampires*, according to the popular belief of the Slavonic, Romanic, and Greek population of the lower Danube and the Thessalian peninsula, are blood-sucking ghosts. In the mythology of the ancient Greeks, beings of similar nature—the Lamias—were beautiful phantom women who by voluptuous delusions allured youths to them in order to feast on their young, pure blood and flesh. And among Slavonic races (e.g., in White Russia, the Ukraine, Poland, Servia, Slavic Bohemia, etc.) there is a superstition that the bodies of those who have died in excommunication by the church are kept by the devil in a kind of life; that they go forth from their graves by night and suddenly destroy other men, and by other means procure food, and thus supply themselves with sustenance. They are called Burkolakkä or Tympanitä; and the only way of escaping from molestation by them is by digging up their unwashed corpses and burning them, after the removal of the excommunication. The vampire proper is the illegitimate offspring of parents themselves illegitimate, or the troubled spirit of one killed by a vampire. By night, especially at full moon, he comes out of his grave, and wanders about in the form of a dog, frog, toad, cat, flea, louse, spider, etc., and sucks the blood from living persons by biting them in the back or neck. If a dead person is under suspicion of being a vampire, his body is disinterred: if putrid, it is sprinkled with holy water; but if red and bloody, the devil is first exorcised by the priest, and a stake driven through the breast, or a nail through the fore-

head, when the body is reinterred. The Vukodlaks of the Servians are particularly fond of the blood of young girls. They pair with the Wjeschtitza, female ghosts with wings of fire, which by night sink down on the breast of sleeping soldiers, and inspire them with their fury. As any one killed by a vampire becomes himself a vampire, when a Wallachian dies, where this superstition prevails, a skilled person, generally a midwife, is always called in, to take precautions against the corpse becoming a vampire, as by driving a nail through the skull, rubbing in various places with the lard of a pig killed on St. Ignatius's Day, etc. Sometimes the vampire is thought to be the soul of a living man, which leaves his body in sleep and is blown in the form of chaff or down, and sucks the blood of other sleepers. The *ghoul* of the Arabs and Persians seems identical with the vampire.—For an account of writings in Germany on this subject, see Rauft's *Treatise on the True Nature of the Hungarian Vampire* (Leip. 1734).

VAMPIRE-BAT: blood-sucking bat of S. America, belonging to the genus *Desmodus*, having a small bifid membrane on the nose, no tail, and the interfemoral membrane little developed. Bats of this genus have two great, projecting, approximate upper incisors, and similar lancet-shaped superior canines, all very sharp-pointed, and arranged to make a triple puncture like that of a leech. There are four bilobate inferior incisors, the innermost separated by a wide interval; the lower canines are small; there are no true molars, but two false molars in the upper jaw, and three in the lower, of a peculiar form, apparently unfitted for mastication. The intestine is shorter than in any other mammal, and the whole structure indicates that blood is the sole food. In parts of S. America vampire-bats are very numerous, and domestic animals suffer greatly from their nocturnal attacks. They seem to take advantage of an existing wound, but they can also make one. In parts of Brazil the rearing of calves is impossible on account of these bats, and there are districts, chiefly those in which limestone rocks prevail, with numerous caves, in which cattle cannot be profitably kept. Vampire-bats sometimes attack men, when sleeping in the open air; but the stories of their fanning their victims with their wings, while they suck their blood, are fabulous.—The name Vampire or Vampire-bat has also been given erroneously to frugivorous bats of s.e. Asia and the Malay Archipelago, as well as to the Spectre-bats (q.v.) of the genus Phyllostoma: see PHYLLOSTOMIDÆ: BAT.

VAMPLATE, or VAMPLET: see under VAMBRACE.

VAN, n. *văn* [an abbreviation of *vanguard:* F. *avant-garde:* F. *avant*, before—from L. *ab antĕ*, from before]: the first line or foremost division of an army, in opposition to the rear or last line or division; the front line or foremost division, as of a fleet; the front of any advancing body. VAN-COURIERS, avant-couriers; light-armed soldiers sent before armies to obtain information, etc. VAN-FOSS, *-fŏs* [L. *fossa*, a ditch]: the outer ditch of a rampart. VAN-

GUARD, the part of an army which precedes the main body on a march.

VAN, n. *văn* [contr. of CARAVAN]: a large covered carriage or wagon for moving furniture, etc.; a conveyance for a wild beast or other show; a carriage which may serve the purpose of a dwelling, as among gypsies and other wanderers; a covered spring-cart for conveyance of goods; one of the carriages of a railway train used in Great Britain for luggage, etc.; the baggage-car.

VAN, n. *văn* [L. *vannus*, a fan]: in *OE.*, anything spread wide by which a current of air is raised; a fan; a wing with which the air is beaten.

VAN, *vän:* vilayet or prov. of Turkey in Asia; bounded e. by Persia, n. by the lately acquired Russian possessions in Armenia; 15,000 sq. m. It consists mainly of a lofty basin, surrounded by steep mountains, in the centre of which is the Lake of Van. The climate is very hot in the lowlands. The productions are corn, fruit, wine, flax, tobacco, cotton, timber, manna, gall-nuts, and honey. The pasturage being exceedingly good, great numbers of live-stock are reared, and, with the other agricultural products, form the chief exports.—Pop. variously stated—half a million to a million or more.

VAN: fortified town of Turkey in Asia, cap. of the vilayet of V.; in a very fertile plain, near the s.e. shore of Lake Van; 145 m. s.e. of Erzerum; lat. 38° 30′ n., long. 43° 18′ e. It is overlooked by a citadel, now much dilapidated. The streets are narrow, dirty, and ill paved, but most of the houses are well built. The principal public buildings, in addition to the citadel, are the mosques, the Armenian churches, the baths, the caravanseras, and the bazaars. The industries of V. are agriculture and the production of coarse chintzes, a woolen cloth called shayak, goat-hair water-proofs, moire antique, and soap prepared from the saline efflorescence of Lake Van. Among the Armenians V. is always called Schamiramakert—i.e., Town of Semiramis. Ancient ruins, and cuneal inscriptions in which the name Xerxes frequently occurs, are found.—Pop. estimated 30,000 to 35,000.

VAN, LAKE OF: inland sea of Turkey in Asia, in the vilayet of Van, encircled by mountains; 80 m. long, and 50 m. wide at the greatest; 1,500 sq. m. It is 5,400 ft. above sea-level, is fed by about eight streams, and has no visible outlet. The narrow part, extending n.e. about 40 m., is very shallow. There is little navigation on the lake. Its waters are somewhat salt, and the only fish caught in it are a kind of bleak, which are salted and exported as sardines throughout Asia Minor. Lake Van was called by the ancients *Arsissa Palus;* also *Thospitis,* from its Armenian name *Tosp.*

VANADIUM, n. *vă-nā'dĭ-ŭm* [after *Vanadis*, a Scandinavian deity]: rare metal of grayish, silvery color, allied to bismuth; symb. V, at. wt. 51·4. The name was given to a substance believed at first to be an elementary metal, but now known to be a compound. Its discovery was ascribed by some to Del Rio 1801, by others to Sefström 1830. The last-named chemist found it in a Swedish iron ore, and named it V., from *Vanadis*, a cognomen of the Scandinavian goddess Freyja. Roscoe has shown that it is a compound of oxygen with a metal, and to this new metal the symbol V. is now appropriated. In the light of Roscoe's discovery, the V. of the old formula becomes V_2O_2, and the oxides VO, VO_2, and VO_3, become V_2O_3, V_2O_4, and V_2O_5; there is, besides, a monoxide, V_2O. V. is present in very small quantities in nearly all clays, and in vanadate of lead, found in Mexico, Chili, and Scotland; its most abundant source is the copper-bearing beds of Cheshire, England. VANAD'IC, a. *-năd'ĭk*, pert. to or obtained from vanadium, as *vanadic acid*; also VANADOUS, a. *văn'ă-dŭs*. VANADATE, n. *văn'ă-dāt*, or VANADIATE, n. *vă-nā'dĭ-āt*, a salt of vanadic acid. VANAD'INITE, n. *-năd'ĭ-nīt*, the vanadate of lead, a rare mineral of a yellowish-brown color and resinous lustre.

VANBRUGH, *văn-brō'*, Sir JOHN: English architect and dramatist: 1666(?)—1726, Mar. 20; b. in Cheshire; son of a merchant, and grandson of a Prot. refugee of Ghent, who had settled in England in the reign of Elizabeth. V. was educated in France, where he entered the French army, but left it after attaining the rank of captain. Returning to England, he soon acquired reputation as an architect. In 1695 he was made sec. to the commission for endowing Greenwich Hospital. His first attempt at play-writing was *The Relapse, or Virtue in Danger*, whose first sketches he had made while in the army. It was brought out at Drury Lane (1697) with such success, and obtained such popularity, that V. ranked ever after as one of the leading wits and dramatists of his day. About the same time he wrote his famous comedy *The Provoked Wife* for Lincoln's Inn Theatre, where it was produced with even greater success than had attended *The Relapse*. He then, in partnership with Congreve, started a theatre in the Haymarket, and there brought out *The Confederacy*. But so ill suited was this building for speaking in that not even the brilliant wit and racy humor of *The Confederacy* could command an audience, and, Congreve abandoning the scheme, the theatre had to be closed. In 1702 he erected, for the Earl of Carlisle, the noble palace of Castle Howard, in Yorkshire; and this led to his being employed as architect of many mansions for the noble and the wealthy in other parts of the country. His reputation was so high that he was commissioned to erect Blenheim House, which the parliament had voted to the Duke of Marlborough; but as no particular fund had been provided for the expenses, and as parliament refused, when applied to, to grant money for that purpose, V.'s commission was more honorable than lucrative. The queen supplied from her

own private purse most of the funds; but after her death, this supply was stopped. The Duke of Marlborough, also having died, left a specific fund to meet the architect's claims; but the duchess not only meanly refused to pay V. his salary, but dismissed him from his office; and the house was completed under other management, though from the original designs. After much trouble, V. got nearly all the money due him; but became a steadfast foe of the Duchess of Marlborough. In 1714 he was made comptroller of royal works. V. died at Whitehall, leaving his drama *The Provoked Husband* unfinished. His plays are licentious in tone and loose in morality, but show brilliant wit, keen satire, and genuine humor. They lack the polish of Congreve's dramas, but are not infected with the artificiality, stiffness, and labored brilliancy which disfigures so many of Congreve's best scenes. The interest is sustained throughout; the characters—such as they are—are real, natural, and racy; the situations striking, and the dialogue is brilliant and unflagging. The best ed. of his plays is in Leigh Hunt's *Comic Dramatists*, to which is prefixed an excellent Life of V. His architectural works are still among the best of their kind—massive, picturesque, varied in outline, and wonderfully skilful in composition, though a frequent carelessness in the management of details spoils some of his best effects. Some recent critics, while fully crediting V. with surprising skill in details in both architecture and comedy, have pointed out his defects in both lines as due to a lack of the 'fusion' and blending necessary to a comprehensive whole.

VAN BRUNT, *văn brŭnt*, HENRY: architect: b. Boston, Mass., 1832, Sep. 5. Having graduated at Harvard 1854, he studied architecture; served as a staff-officer in the navy 2 years during the civil war; then practiced as an architect first in Boston, and later in Kansas City, Mo. He designed Memorial Hall, Harvard Library and Medical School, also the Episc. theol. school, at Cambridge, Mass., and various buildings in Boston and other cities of Mass. In the w. his firm (V. B. & Howe) were architects of many great mercantile buildings and of station buildings on the Union Pacific railroad.

VAN BUREN, *văn bū'rĕn*, MARTIN: eighth president of the United States: 1782, Dec. 5—1862, July 24 (pres. 1837–41); b. Kinderhook, N. Y. At the age of 14 he began to study law; he was an active politician before he attained his majority; and was admitted to the bar 1803. He was a zealous supporter of Thomas Jefferson; was elected surrogate of Columbia co. 1808. In a convention of the republican party at Albany 1811, he was prominent among the opponents of the recharter of the U. S. Bank. He was elected to the state senate 1812, and there upheld Gov. Tompkins in his action against the 'Bank of America.' He was atty.gen. of the state 1815–19, and meantime was again elected to the senate 1816. With Benjamin F. Butler (of N. Y.), Edwin Croswell, and William L. Marcy, he formed a combination of democratic

leaders later known as the 'Albany Regency,' which for 20 years dominated the politics of N. Y. As member of the N. Y. constitutional convention 1821, V. B. favored an extension of the electoral franchise, but opposed universal suffrage. He was chosen U. S. senator the same year, and re-elected 1827, but resigned 1828 to assume the governorship of the state. He was appointed by Pres. Jackson sec. of state 1829, Mar.; but resigned 1831, Apr., and went to England in Sep. as U. S. minister plenipotentiary: the senate, however, refused to approve his appointment, and he returned home. He was elected vice-pres. of the United States 1832, and pres. 1836. A monetary crisis existed at the beginning of his term of administration; the banks suspended specie payment, and V. B. urged the establishment of an independent treasury system: after much acrimonious debate the Treasury Bill was passed in the last year of V. B.'s administration. Congress also enacted the 'pre-emption law' of pres. V. B., giving to settlers on public lands the preferential right of purchase. V. B. was renominated for the presidency 1840; the nominee of the whig party was William Henry Harrison: after the most exciting political canvass till then ever seen in the United States, V. B. suffered a disastrous defeat, receiving only 60 electoral votes out of 294; yet the popular suffrages for V. B. were 367,000 in excess of those that he had received 1836. His last message to congress recommended the enactment of more stringent laws to suppress the African slave-trade. He sought the democratic nomination to the presidency again 1844, but was rejected on account of his opposition to the annexation of the republic of Texas. The democrats having nominated Gen. Lewis Cass 1848, V. B. was named as an opposition democratic candidate by a convention of the 'free democracy,' on a platform which declared that 'the federal govt. should relieve itself of all responsibility for the existence or continuance of slavery.' This defection resulted in the defeat of Cass and the election of the whig candidate, Gen. Zachary Taylor. V. B. now retired from political life. He left in MS., a work which was published 1867—*Inquiry into the Origin and Course of Political Parties in the United States.*

VANCE, *vănss*, ZEBULON BAIRD: 1830, May 13—1894, Apr. 14: politician: b. Buncombe co., N. C. He was educated at Washington College, Tenn., and at the Univ. of N. C. He was admitted to the bar 1852, and settled at Asheville. He was a member of congress 1858–61; gov. 1862–66 and 1877–79; U. S. senator 1879–92, his last term expiring 1897. Though he opposed secession, he afterward, as col. of the famous 26th N. C. regt., was active in the war, and later in opposing the reconstruction measures of congress.

VAN CORTLANDT, *văn kōrt'lant,* PHILIP: soldier: 1749, Sep. 1—1831, Nov. 5; b. near Croton, N. Y. Having graduated at King's (Columbia) College, New York, 1758, he became land-surveyor. He was commissioned lieut.col. of a N. Y. battalion 1775, and col. 2d N. Y. regt. 1776. He was present at Burgoyne's surrender, and served with Gen. Sullivan, in the campaign against the Six Nations 1779; afterward he took part in the campaign in Va. which ended at Yorktown. After the war, congress promoted him to the rank of brig.gen. In civil life he was member of the assembly and senate of N. Y., and was representative in congress 1793–1809.

VANCOUVER, *văn-kō'vĕr:* city, cap. of Clarke co., Wash.; on the Columbia river and a branch of the Northern Pacific railroad; 6 m. n. of Portland, Or., with which it is connected by three lines of steamboats and one stage line. It has the finest site on the middle Columbia, and from it Mt. Hood (11,225 ft. high) presents a strikingly grand appearance. It contains a handsome co. court-house, large orphan asylum, hospital, public-school building, masonic temple, public square of 5 acres with fountain, U. S. land office, U. S. milit. reservation handsomely laid out, several imposing churches, 1 national bank (cap. $100.000). 1 state bank (cap. $30,000), street railroad, electric lights, and 3 newspapers. The city is supplied with pure spring water, led through mains to all buildings. The industries comprise 5 saw-mills, flour-mills, sash and door factories, artificial-stone factory, and machine-shops.—Pop. (1880) 1,722; (1890) 3,545; (1900) 4,006.

VANCOUVER: city and seaport of Brit. Columbia; on Burrard Inlet, and on the Canadian Pacific railroad, about 12 m. n. of New Westminster, and 85 m. n.e. of Victoria. It is the largest city on the mainland of British Columbia; is the centre of an agricultural, mining, and lumber region, and near it are excellent salmon-fishing grounds. The site was chosen for its fine harbor, and it was decided to make it the w. terminal of the Canadian Pacific road. The city was laid out and built; was wholly destroyed by fire, and rebuilt in 1886. By 1895 it had a property valuation more than $18,000,000. It is connected with New Westminster by electric railway, and with Victoria by steamers. Stanley Park, at entrance to the harbor, is on a promontory, and has an 8-mile waterside driveway. V. has foundries, machine-shops, fish-canneries, a sugar-refinery, pork-packing establishments, and sash, door, and blind factories, etc.; 4 banks, 3 daily and 2 weekly papers, and many churches and academies.—Pop. (1889) 11,000; (1891) 13,685; (1901) 26,133.

VANCOUVER, *văn-kō'vĕr*, GEORGE: navigator: 1758–1798, May 10: b. England. At the age of 13 years he entered the navy; was with Capt. Cook in his 2d and 3d voyages, 1772–75 and 1776–80. On his return to England, V. was commissioned lieut. and appointed to command a war-vessel: as lieut. he served under Admiral Rodney in the W. Indies; then on the Jamaica station. In 1791 he commanded a squadron dispatched to n.w. America, Hawaii, and Nootka, to find whether there were any passage from the N. Pacific to the Atlantic Ocean. He first made for Australia, where a survey of the s.w. coast was made. After reaching Tahiti and spending several weeks at the Sandwich Islands, he (1792) sighted the w. coast of N. America (now California), and navigated the passage through Juan de Fuca which separates the island of Vancouver from the mainland. He spent the autumn in visiting the Spanish settlements in New California, and surveying the coast and coast-region as far south as 35° n. lat. In 1794 he explored Cook's Inlet, and established the fact that it was not a river. Afterward he visited Nootka. Returning by way of Cape Horn, he reached home 1795. The surveying service was extremely arduous, being performed mostly in open boats, and V.'s health was broken. The remainder of his life he spent in writing his narrative, *Voyage of Discovery to the N. Pacific Ocean and Round the World* (3 vols., with atlas).

VANCOU'VER ISLAND: island in the Pacific, forming part of Brit. Columbia and of the Dominion of Canada; bounded w. by the Pacific, e. by Queen Charlotte Sound, Johnston Strait, Discovery Strait, and Strait of Georgia, which, taken together, form an open sea way, varying in width from 5 to 80 m., separating the island from the mainland; lat. 48° 20′—51° n., long. 123°—128° w.; 250 m. in length, 10 to 70 m. in breadth; estimated about 16,000 sq. m. The main mass of the island is a mountain ridge, with peaks 6,000 to 9,000 ft. high. The coast is generally pre-

cipitous. There are, however, in many coast-districts, especially on the s.e. and eastern sides, undulating tracts, thickly wooded, but with patches of open grass-land. The outline of the island is boldly picturesque. The shores are marked by abrupt rocky cliffs and promontories, by pebbly beaches and sheltered coves, with fine harbors. The w. shores are gloomy and frowning in aspect, deeply indented by fiord-like arms of the sea, whose banks are formed by steep rocks, rising like walls. The surface is diversified by mountain, precipice, hill, dale, and lake, and the whole country is more or less densely wooded. There are no navigable rivers, and the streams, which are torrents in winter and are nearly dry in summer, are short, and are valuable only as supplying water-power. Springs are numerous, and the water excellent. The climate closely resembles that of Great Britain, with modifications due to the position of the island. As late as the middle of June, the summer resembles a late English spring—having a clear atmosphere, bright sun, and cool winds. The winter, as a rule, is open and wet; the spring late and cool; the summer, as a whole, drier and warmer than that of Great Britain. The maximum temperature is about 84° F., the minimum about 22° F. The climate of the n. and w. is much more severe. Only a small proportion of the surface is suited for agriculture, four-fifths being little better than barren rock. The usual crops are wheat, barley, oats, and peas: the green crops are turnips, mangle-wurzel, vetches, potatoes—of unsurpassed excellence—and all sorts of vegetables. Of wheat, the average production is 25 to 30 bushels per acre; of oats, 40 bushels; barley, 40 bushels. Fruit-culture is very profitable. Gold has been found; coal is very abundant; copper, silver, lead, and other ores abound. The puma, the bear, and wolf range in the forests; two kinds of deer are found; there are two kinds of grouse, and snipe and wild fowl in great variety. Salmon abound. Extensive banks lie about 32 m. off the s.w. shore—all well stocked with fish, especially the cod, herring, haddock, whiting, halibut, and sturgeon, for which there is a good market all along the coast southward. Among the valuable woods of the island is the white fir or Douglas pine, much used for spars: logs of this tree have been known to 'square' 45 in. for a length of 90 ft. Ship-building is an important industry.—The chief towns are Victoria (q.v.), cap. of the island and of the prov.; Nanaimo, 73 m. by rail n. of Victoria, centre of the coal-mining industry (pop. 4,000): the annual output of coal—both anthracite and bituminous—is about 250,000 tons, giving employment to 1,100 men; Esquimalt, 3½ m. w. of Victoria, an important naval and milit. station, having a government dry-dock 450 ft. long, 26 ft. deep, and 65 ft. wide at the entrance.

The island was discovered 1592 by Juan de Fuca; and its coast was roughly surveyed 1778 by Cook, and later (1792–94) by Capt. Vancouver (q.v.) of the Brit. navy. Its possession was secured to Britain by treaty 1846; previous

to 1858 it was held, with Brit. Columbia, by the Hudson's Bay Company under lease from the crown; later it was for two years an independent colony; in 1866 V. I. and Brit. Columbia were united: see COLUMBIA, BRITISH. V. I. is important to the Dominion and to Great Britain on account of its great natural resources, as well as of its geographical position. The Canadian Pacific railway terminates on the coast opposite its southern end.—Pop. (1881) 9,991; (1901) 27,198.

VAN CURLER, *văn ker'lĕr* (or VAN COR'LEAR). ARENDT: pioneer settler of N. Y.: about 1600–67; b. Holland. He came to New Netherlands 1630, and later became supt. of the manor of Rensselaerswyck, the estate of his kinsman Killian van Rensselaer, which comprised about 1,000 sq. m. of country, reaching from Beeren Island in the Hudson to the mouth of the Mohawk. V. C. learned the speech of the Iroquois nations, and established friendly relations between the aboriginals and the Dutch, thus erecting a defense of the Dutch colonies against the encroachments of the French from Canada, and establishing a profitable trade in furs with the natives. About 1650 he settled on his own farm at West Troy, still retaining his active interest in the welfare of the colonists and the aboriginals, maintaining peace between them, and checking the trade in alcoholic drink. He brought out from Holland, 1661, a colony whom he settled at Schenectady on lands of their own (not on the Patroon's land), bought from the Mohawks. V. C. was often instrumental in relieving and liberating French missionaries and adventurers held in captivity by the Iroquois. After the English conquest of New Netherlands, he was a valued counselor of the new *régime*. The Mohawks, in addressing the governors of the colony of N. Y., always saluted them as 'Corlear.' He left at his death 2,000 letters and other papers.

VANDA, *văn'da:* genus of plants of nat. order *Orchideæ*. *V. cærulea*, one of the most beautiful of Indian orchids, is highly prized by cultivators, and plants sell at high prices. It has panicles of azure flowers. Hooker found it on the Khasia Mountains, growing in great profusion, epiphytical upon the oak, banyan, etc.

VANDAL, n. *văn'dăl* [L. *Vandăli*, *Vandili*, *Vanduli*, a people of n. Germany in the time of Tacitus: Ger. *wandeln*, to walk, to travel]: one of a barbarous race inhabiting the southern shores of the Baltic, which invaded the Roman empire in the 5th c., noted for their fierceness and their indiscriminate destruction of the monuments of art and the productions of literature; hence, one who destroys any monument of art or literature; one hostile to the arts or literature; a barbarian. VAN'DAL, a., or VANDALIC, a. *văn-dăl'ĭk*, pertaining to or resembling the Vandals; rude; barbarous. VANDALISM, n. *văn'dăl-ĭzm*, the spirit or conduct of the Vandals; any outrage against civilized usages. —The *Vandals* were probably of Germanic origin, though some consider them Slavic. Procopius, who agrees with

Pliny in considering them one with the Goths, states that they originally occupied the country about the *Palus Mæotis* (Sea of Azov); but it appears that they afterward migrated n.w., and settled s. of the Baltic, between the rivers Vistula and Viadus (Oder). They make their first appearance in history in the 2d c., when they inhabited the n.e. slopes of the Riesengebirge (called, after them, *Vandalici Montes*), figuring as associates of the Marcomanni and Quadi in plundering expeditions into Pannonia, and in the wars with Marcus Aurelius. In the latter half of the 3d c. they are found, with the Goths and Gepidæ, in the Roman province of Dacia. According to Jornandes, the Gothic king Geberic annihilated a large part of the nation on the banks of the Maros: the remainder were transplanted by Constantine to Pannonia, where for 60 years they lived in peace. At the beginning of the 5th c. they abandoned their new homes, and in company with the Suevi, Alani, and other German tribes, led by King Godegisil, burst into Gaul, which they ravaged for three years. Thence they swept through the passes of the Pyrenees into Spain, which suffered similar ravage; and finally, after much quarrelling and fighting with their German associates, they settled in a part of Bætica, which received from them the name *Vandalitia* (mod. *Andalusia*). In 429, at the call of Bonifacius, gov. of Africa, who had been driven into rebellion by the false representations of Aëtius (see VALENTINIAN III.), they crossed the Strait of Gibraltar, under Genseric (q.v.), 50,000 to 80,000 strong, carrying devastation and ruin from the Atlantic to the frontiers of Cyrene. They were joined by the Donatists (q.v.), a sect of African heretics, and, being themselves Arians, they inflicted great cruelties on the orthodox Christians. Meanwhile Boniface had discovered the treachery of his rival Aëtius, and, seeking too late to remedy the consequences of his too credulous resentment, he advanced with a small and hastily-levied force; but was defeated with considerable loss, and driven into Hippo (now *Bona*), which he defended for more than 14 months. Boniface, reinforced by a Byzantine army under Aspar, now sallied out upon the Vandals and met a second defeat, which decided the fate of Africa. In 439 Genseric (correctly Gaiseric) broke the peace which he had concluded with Valentinian III., 435, and conquered Carthage. A new peace was established, which recognized the authority of the Vandals over n. Africa from the Atlantic to Cyrene, over the Balearic Isles, Sardinia, Corsica, and part of Sicily. In 455 the Vandals invaded Italy, and plundered Rome for 14 days. Their mutilation and destruction of the works of ancient art collected in the city originated the application of the term *Vandalism* to all similar barbarism. After the death of Genseric (477), his son, Hunneric, cruelly persecuted the Catholic Christians, warred against the Moorish races in n. Africa, then trying to recover their independence, and kept the Mediterranean and its coasts in alarm by his piracies. His successors, Guntamund (d. 496) and Thrasamund (d. 523), were compara-

tively mild and tolerant rulers; the latter was even friendly to literature. The warm climate, with its luxury and pleasures, now began to enervate the Vandals, and the natives in various parts of Africa showed that they had ceased to fear them. Thrasamund was compelled to solicit aid from his brother-in-law, Theodoric (q.v.), who sent him a Gothic contingent to help him against the Moors of Tripoli. After his death, Hilderic, son of Hunneric, became ruler; but he showed such strong leanings toward Catholicism (owing to his long residence in Constantinople) that his subjects grew discontented, and he was overthrown by his uncle, Gelimer, 530. This led Emperor Justinian to send an expedition under Belisarius against Gelimer, 533. When Gelimer heard of the arrival of the great Byzantine general, he caused Hilderic and his sons to be put to death, but was himself soon forced to seek refuge in the wilds of Numidia. In 534 he surrendered, was carried to Constantinople in triumph, and died in Asia Minor. Most of the Vandals were drafted into the imperial army, and perished in the wars with Persia. The few who remained in Africa rapidly disappeared among the natives.—See the histories of the Roman empire; also Papencordt (1837), and works of Felix Dahn on the ancient Germanic peoples (1861–71).

VANDENHOFF, *văn'dĕn-hof*, GEORGE: actor and elocutionist: b. England, 1820, Feb. 18. Having appeared on the Covent Garden stage in London, he settled in the United States 1842, and for 16 years had a successful career as actor in this country. Retiring from the stage 1856, he studied law, and was admitted to the bar 1858, but scarcely entered practice. He travelled through the United States and England, giving public readings and conducting classes in elocution. He wrote: *The Art of Elocution; Clerical Assistant; A Lady's Reader*, and two vols. of *Reminiscences* and *Notes*.—V.'s wife (d. 1854), a successful actress, retired from the stage and gave lessons in dramatic action and elocution.

VANDERBILT, *văn'dĕr-bĭlt*, CORNELIUS: financier: 1794, May 27—1877, Jan. 4; b. near Stapleton, Staten Island, N. Y. At the age of 16 years he owned a boat in which he transported passengers between Staten Island and New York, and in a few years was owner of or had an interest in several sloops, schooners, etc., plying in New York harbor and the Hudson river. He was employed as steamboat capt. 1817–27, but then became owner of a ferry service between New York and Elizabeth, N. J. He began to build steamboats 1829, and established lines of transportation in many directions; and before he was 40 years old he had accumulated a fortune of $500,000. His popular title 'Commodore' was bestowed in consideration of his activity as a builder of steamboats and manager of steamboat lines. In the days of the California gold fever, V. made large profits by establishing a line to the Pacific *viâ* Nicaragua Lake. He sold his interest in the Nicaragua line to a company 1853; and when the purchasers failed to make payment, V. became their competitor, ruined their trade, and added enormously to his own wealth. While

England was engaged in the Crimean war, V. established a steamship line of three fast vessels between New York and Havre. Though he was a large holder of railroad securities as early as 1844, not till 1863 did he rise to prominence as an exploiter of that kind of property. He then bought a large proportion of the stock of the New York and Harlem railroad, obtained a valuable franchise from the legislature, and thus quickly caused the stock to rise in value from 10 per cent. to par. Through a miscalculation of his rivals in the stock exchange, V. was enabled to buy nearly all the stock of the Harlem at artificially low prices; then he sold again at an enormous advance. He now began to buy shares in the Hudson River railroad, got control of it, and had the two previously competing roads consolidated by act of the legislature: again the devices of his rivals inured only to V.'s advantage: buying the stock at less than $75, he sold what he was willing to part with at $285. Then came the acquisition of the lines from Albany to Buffalo, and the formation of the N. Y. Central Railroad Co. Of other lines he successively obtained control, till he was master of a continuous line from New York to Chicago: of the capital stock of this great line ($150,000,000) one-half was owned by V. While living, he gave $50,000 to establish in New York the 'Chh. of the Strangers,' and $1,000,000 to found the Vanderbilt Univ. (q.v.). He left his whole estate (estimated at $100,000,000) to his son William Henry V. (q.v.), except $11,000,000 bequeathed to William Henry's sons, and $4,000,000 to his own two daughters.

VAN'DERBILT, William Henry: capitalist: 1821, May 8—1885, Dec. 8, b. New Brunswick, N. J.; son of Cornelius V. (q v.). He became clerk to his father at the age of 17 years, but after a year entered a bank as clerk; he retired to a farm 1842. His able management as receiver of the Staten Island railroad caused his father to recognize him as his destined successor, rather than Cornelius Jeremiah V., elder bro. of William. To William was intrusted the responsible management of Cornelius V.'s great railroads, and in this post the son further justified the father's confidence in him. On the father's death, William succeeded to the bulk of the paternal estate. He compromised with his bro. Cornelius Jeremiah for $1,000,000, and with his two sisters for $200,000 each a suit brought by them for a larger share in the estate left by Cornelius V. He gained control of many additional railroad lines built a magnificent residence in New York; was an ardent lover of fast horses; gave $200,000 to the Vanderbilt Univ., $100,000 to found a theological school in the same institution, and $10,000 for a library there; $500,000 to the New York College of Physicians and Surgeons to erect new buildings; $50,000 to the Chh. of St. Bartholomew, New York; $100,000 to the men employed on the N. Y. Central railroad; $103,000 to bring from Egypt to New York and there erect the obelisk now in the Central Park; and $150,000 to Gen. Ulysses S. Grant (a loan which V. strove to have Gen. Grant accept as a gift).

By his will he left to each of his 8 children $10,000,000; to Cornelius, his eldest son, $2,000,000 additional, and to Cornelius's eldest son $1,000,000; the residue went in equal shares to his two eldest sons, but charged with an annuity of $200,000 to his widow. His testamentary bequests to public and charitable institutions amounted to $1,000,000.—His eldest son, CORNELIUS (b. Staten Island, N. Y., 1843, Nov. 27), was a treasurer (1867–77) and vice-pres. (1877) of the N. Y. and Harlem railroad. He erected in New York a magnificent structure in a prominent situation as a club-house and rendezvous for the employés of his railroads; contributed $100,000 to the Prot. Episc. cathedral fund; presented to the Metropolitan Museum of Art a valuable collection of drawings by old masters, and Rosa Bonheur's *Horse Fair*.—The second son, WILLIAM KISSAM V. (b. Staten Island, N. Y., 1849, Dec. 12), became a clerk in the offices of the Vanderbilt railroads at an early age; was made 2d vice-pres. of the N. Y. Central Railroad Co. 1877; and became pres. of the New York Chicago and St. Louis Railroad Co. 1882.

VAN'DERBILT UNIVER'SITY: institution of learning in Nashville, Tenn.; chartered by the Tenn. legislature as 'Central University of the Meth. Episc. Chh., South,' 1872; but took its present name 1873 in honor of its principal benefactor: see VANDERBILT, CORNELIUS. One condition of Vanderbilt's gift was that Bp, McTyeire, of the Meth. Episc. Chh., S., should be pres. of the board of trustees. A plot of ground comprising 75 acres was purchased as a site, and the corner-stone of the main univ. building was laid 1874, Apr. 28: the univ. was opened for students 1875, Oct. 4, with L. C. Garland, LL.D., as chancellor, and T. O. Summers, D.D., as dean of the theological faculty and *ex officio* vice-chancellor. The number of students in the first year was 300. Students in the theol. dept., and students in the literary and scientific depts. who are preparing for the Christian ministry, have tuition gratis. In the year 1894 there were in the univ. 103 profs. and instructors; and 711 students subdivided as follows: academical dept., 22 profs., 195 students; biblical dept., 6 profs., 62 students; dept. of law, 4 profs., 30 students; dept. of medicine, 24 profs., 243 students; dept. of pharmacy, 8 profs., 23 students; dept. of dentistry, 15 profs., 128 students; dept of engineering, 24 profs., 54 students. The univ. had more than 15,000 vols. in its library; fellowships in all depts. 15; scholarships 9; value of scientific apparatus $150,000. In 1901 there were 101 instructors and 754 students, 30,000 vols. in library; value grounds and buildings $750,000; productive funds $1,400,000; income $135,000.

VAN DER GOES, HUGO: see GOES.

VAN DER HELST, BARTHOLOMEW: see HELST.

VANDERHEYDEN, *vân-dĕr-hī'dĕn*, DIRK: first settler on the site of Troy, N. Y.: about 1680–1738, Oct.; b. Albany. He obtained a grant of 490 acres of land 1720, on condition of annually paying '5 schepels of wheat and 4 fat fowls.' V. conducted a ferry at the *Poesten Bouwery* (as his farm was called), and 1789 the place took the name of Troy. The V. mansion, built of bricks brought from Holland, is described in Washington Irving's story of Dolph Heyliger in *Bracebridge Hall.*

VAN DER HEYDEN, JAN: see HEYDEN.

VANDERLYN, *văn'dĕr-lĭn*, JOHN: painter: 1775, Oct. 15—1852, Sep. 24; b. Kingston, N. Y. In New York he attended a school of drawing; then in Philadelphia spent some time in the studio of Gilbert Stuart (q.v.), copying some of Stuart's portraits. Aaron Burr aided V. financially; he visited France 1796, and there spent 5 years. He painted two views of *Niagara Falls*, which were engraved in London 1804; also portraits of Aaron Burr and his daughter Theodosia. Later he spent several years in England, France, and Italy. His works are very numerous, and many of them are highly esteemed by competent critics. His greatest works are *Marius amid the Ruins of Carthage* and *Ariadne.*

VAN DER MEER, JAN: painter (1632–75): see MEER.

VANDEVELDE, *vân dĕh-vĕl'dĕh*, ADRIAN: painter: 1639–72; b. Amsterdam; bro. of William V., the Younger (q.v.). He was pupil of Jan Wynants and Philip Wouwerman, and was employed by him and by Hobbema, Ruysdael, Verboom, and other Dutch artists, to introduce figures of animals into their landscapes—a branch of art in which V. was then unrivalled. Among the most noteworthy works of V. are a few winter scenes with skaters, and a Descent from the Cross: in all nearly 200 paintings by V. have been catalogued. He executed also about 20 etchings of extraordinary merit.

VANDEVEL'DE, WILLIAM (the Elder): Dutch painter: 1610–93; b. Leyden. He was bred a sailor; and having natural aptitude for art, he busied himself in drawings of marine subjects, which, becoming known, were seen to be of great merit. He was chosen 1666 to sail with the fleet of Admiral de Ruyter, to illustrate on canvas its operations against the English. His sketches of several engagements which he witnessed procured him a great reputation; and 1675 he was induced to settle in England, as painter of sea-fights to Charles II., who allowed him a pension of £100 a year. On the death of Charles, his services were retained at the same rate by his successor, James II. He died in London, and was buried in St. James's churchyard. His works were mostly colorless drawings, of great beauty and precision, many of which were afterward painted upon in oil by his much more famous son.

VANDEVEL'DE, WILLIAM (the Younger): Dutch marine painter: 1633–1707, Apr. 6; b. Amsterdam. He received his education in art from his father (William V., the Elder), whom he followed to England. He was employed to color the designs produced by his father, and for this service a pension of £100 a year was assigned. This official employment was merely subsidiary, his time being mainly given to the series of original works which have assured him his rank as one of the greatest of marine painters. In his rendering of the ocean, in its various moods, V. has had few equals; and his works are now highly valued by the connoisseur. The best are in England, the gallery at Bridgewater House particularly being rich in fine specimens. V. lived mostly with his father at Greenwich, and afterward in London, where he died.

VAN DIE'MEN'S LAND: see TASMANIA.

VAN DYCK, *vân dīk*, Sir ANTHONY: eminent painter: 1599, Mar. 22—1641; b. Antwerp. His father, according to Houbraken, was a glass-painter. After making considerable progress in the study of art under Van Balen, he was, 1615, admitted as a pupil of Rubens, who was not slow to appreciate his talents. In 1621, by advice of Rubens, he visited Italy. The works of the great Venetians were the first to attract his attention. After leaving Venice he resided in Genoa, then in Rome; and he went a second time to Genoa, whence he made a short visit to Palermo. V. D. was five years in Italy, and from the number of portraits painted by him in Genoa—many of the best of his works in his Italian manner are still there—he must have lived a considerable portion of the time in that city. On his return to Antwerp 1626, he executed various pictures for churches, and the portraits classed among those painted in his Flemish style; the series of cabinet portraits of the painters of his day, engraved by Vostermans, etc., and most of which are now in the possession of the Duke of Buccleuch, also were painted at this time. About 1630–1 V. D. visited England; but, meeting with no encouragement, remained only a short time. In 1632 he came to England, by invitation of the Earl of Arundel, at the command of Charles I. He was lodged at Blackfriars, was soon afterward knighted, and had a pension of £200 a year settled on him. His commissions were now numerous; he was enabled to live in great style, entertained people of high rank, and had a country-house at Eltham, in Kent. His wife, Marie Ruthven, by whom he had one daughter, was the daughter of Patrick Ruthven, physician, fifth son of Lord Gowrie. V. D. died in London, leaving property to the amount, it is said, of about £20,000. Only 20 years passed from the time when Van Dyck left the studio of Rubens till his death; and during that short career, the number of pictures executed by him, according to what is considered a truthful statement, seems almost incredible, for in Smith's *Catalogue Raisonné of the Works of the Dutch and Flemish Painters* there are descriptions and interesting particulars of more than 950.

This artist's works may be classed as executed in three distinctly marked styles: 1. Those painted in Italy 1621–26: these are distinguished by deep tone and color, and dignity of character and expression: the portraits of the Lomellini Family and an Italian Nobleman, in the Scottish National Gallery, are good specimens of this period. 2. His productions at Flanders 1626–31 are known as done in his Flemish style: these works are executed with much *impasto* or body of color in the lights, and transparency in the shadows. This was perhaps the period of his finest works, among which the best are the portrait of Snyders the painter, now the property of the Earl of Carlisle; the companion-picture of Snyders's wife, now belonging to the Earl of Warwick; and the portraits of Philip le Roy and of his wife, Madame le Roy, purchased by the Marquis of Hertford at the sale of the king of Holland's pictures. 3. The portraits painted in England 1631–41: these are noted for grace and elegance, but many of them were slight in execution, or done partly by assistants. Van Dyck's biographers and critics generally dwell at great length on his Scripture subjects, and express regret that he gave so much of his time to portrait-painting: thus, Sir Joshua Reynolds ranks his painting of the Crucifixion in the Mechlin cathedral one of the finest pictures in the world; but many recent critics express a different view of his Scripture paintings in general. No Scripture subjects by Rubens or Van Dyck, or produced in any of the later schools, will stand comparison, for purity of feeling and appropriate technical execution, with the works of the earlier masters; and the allegorical pieces so much in vogue in the 17th c. are little in accordance with the ideas of the present time. But all the portraits by Van Dyck are interesting and valuable historical presentations, marvellous in their truth and vividness, of characters who acted important parts in an era noted for great events. Van Dyck's etchings are admirable. Several of the portraits in the collection of portraits of artists are etched by him. The impressions of those that were thrown off, when the heads merely were etched, are of great value.—See Carpenter's *Memoir* (1844); the short monograph by Head; but especially the great work of Guiffrey, *Antoine Van Dyck, sa Vie et son Œuvre* (Paris 1882).

VANDYKE, n. *văn-dīk′:* a neck-collar scalloped or pointed as in the portraits by *Van Dyck* (q.v.), in the reign of Charles I., or one of the scallops or points which form the edge or border: V. to slash or cut out, after the manner of certain dresses in the portraits of Van Dyck. VANDYKED′, a. *-dīkt′*, slashed or notched with indentations and points.

VAN DYKE, *văn dīk*, HENRY, D D. (written HENRY VAN DYKE): Presb. minister: b. Germantown, Penn., 1852, Nov. 10; son of Henry Jackson V. D. He graduated at Princeton 1873; then studied in the Princeton Theol. Sem. till 1877, meanwhile receiving license to preach 1876. While in the seminary, he was corresponding ed. of the *Presbyterian* and ed. of the *Princeton Book*. After a year of study in Berlin, he was pastor of a Congl. chh. in

Newport, R. I., 1878–82; since then he has been pastor of the Brick Presb. Chh. in New York. He is a vigorous thinker and a graceful and suggestive writer. Among his publications are several essays, biographical and critical, on eminent poets and authors; a volume, *The Reality of Religion; The Poetry of Tennyson* (1889); *Straight Sermons to Young Men and other Human Beings* (1893); *The People Responsible for the Character of their Rulers* (1895); *Little Rivers* (1895); *The Story of the Other Wise Man* (1895); and his course of lectures (1896) in the Divinity School of Yale Univ.

VAN DYKE, Henry Jackson, D.D.: Presbyterian clergyman: 1822, Mar. 2—1891, May 26; b. Abingdon, Penn. He graduated at the Univ. of Penn. 1843; studied theol. at Princeton, and was ordained 1845. His first pastorate was at Bridgeton, N. J., 1845–52; then he was settled in Germantown, Penn., one year; 1853–91 he was pastor of the Second Presb. Chh., Brooklyn, N. Y.; 1891 was chosen prof. in Union Theol. Sem., New York. In the discussion of the question of revising the Presb. confession of doctrine, he was a prominent advocate of liberal revision. Dr. V. D. was learned in historical theology, independent and comprehensive in thought; and presented a rare combination of keenness and power in controversy with fervent charitableness of spirit. He was moderator of the Presb. gen. assembly 1876.

VANE, n. *vān* [AS. *fana;* Dan. *fane;* Icel. *fani;* Dut. *vaan;* Ger. *fahne*, a flag or standard: L. *pannus*, a cloth, a rag]: a thin plate of metal, or slip of wood, cut into some figure and made to move on a stem at the top of a spire or any other elevation, in order to show the direction of the wind; a weather-cock; the broad part of a feather on either side of the shaft; the web.

VANE, *vān*, Sir Henry: notable English politician: 1612–62, June 14; b. Hadlow, Kent; son of Sir Henry Vane (the Elder) and Frances Darcy. His father, distinguished statesman in the reigns of Kings James I. and Charles I., and received many proofs of the royal favor; he died 1654.—His son, Sir Henry Vane (the Younger), studied at Westminster and Magdalen Hall, Oxford, where he appears to have adopted those republican principles for which he afterward became famous. His travels in France and Switzerland strongly confirmed him in his aversion to the govt. and discipline of the Church of England, and 1635 he sailed for New England—the refuge of disaffected spirits in those days. He was soon chosen gov. of the Massachusetts colony, and evinced great ability in administration; but his predilections for 'Antinomian' opinions soon caused the loss of his popularity, and about 1636 he returned to England. He now married a daughter of Sir Christopher Wray, of Ashby, in Lincolnshire, and entered on a political career. Through his father's interest he was appointed treasurer of the navy, and entered parliament for Kingston-upon-Hull 1640; but immediately afterward joined Pym and the anti-court party, of

which he became one of the most vehement and resolute leaders. When the civil war broke out, no man was more conspicuous in the military and theological politics of the time than Vane. He carried to the house of peers the articles of impeachment against Abp. Laud; he was a member of the Westminster Assembly, in which he stood with Cromwell in the demand for full religious liberty; he promoted the Solemn League and Covenant, though in his heart he abhorred both it and the Presb. form of church govt., and only used them as against the bishops; and he succeeded in inserting the words *according to the Word of God* before the words 'and the example of the best Reformed churches.' He was the chief instrument in carrying the 'self-denying ordinance' (1644), and one of the commissioners at the treaties of Uxbridge (1644–5) and the Isle of Wight (1648). But he did not view with satisfaction the increasing power of Cromwell and the army, and for some time he withdrew from public affairs. In the measures leading to the king's death, he took no part. On the establishment of a commonwealth, however, 1649, Feb., V. was appointed one of the council of state; yet his antipathy to Cromwell, and his factious activity, so much increased that Cromwell called him a 'juggling fellow;' and was probably in deep earnest when, at the dissolution of the commons, 1653, April, against which V. protested, he cried out: 'The Lord deliver me from Sir Harry Vane!' In 1656 V. wrote a book entitled *A Healing Question Propounded and Resolved*, so hostile to Cromwell's protectorate that it was found necessary to imprison the author in Carisbrooke Castle, Isle of Wight. He was released after four months, and Cromwell attempted to win him over, but V. was inflexible; and during the rule of both Cromwell and Richard, he maintained an attitude of sullen discontent. After meddling a little in the helpless intrigues that followed the abdication of Richard, he was ordered by parliament to withdraw to his house at Raby. When the Restoration took place, V. was one of the 20 persons excluded from the *Act of General Pardon and Oblivion;* and 1660, July, he was committed to the Tower. He was arraigned, and indicted of high treason before the Middlesex grand jury, 1662, June 2; and having been refused the aid of counsel, and not having been allowed to see the indictment before his trial, presented his own case in a powerful and eloquent plea. But the king was resolved on his death, and V. was found guilty (on the 6th), and on the 14th was beheaded on Tower Hill. His son was knighted by King Charles, and raised to the peerage by King William, as Lord Barnard of Barnard Castle.

V. was an intense, restless, unmanageable man—a real thorn in the flesh of the great Cromwell. He had a keen and strong intellect, but used it with that perverse directness that turns honesty itself into a vice. He seems to have been morally disdainful—perhaps intellectually incapable—of so classifying his theories as to advance the greater ends at some sacrifice of the less. Such a mode

tends to fanaticism; accordingly V. accepted to some extent the tenets of the Fifth Monarchy Men (q.v.), and was given to extravagant religious musings, and to praying (with his friends) in language wholly unintelligible. His integrity and disinterestedness were shown by his resigning his office of treasurer of the navy (about 1641), and, when replaced in it by parliament, insisting on a refusal of its great emoluments (stated at £30,000 annually), stipulating only that a payment of £1,000 should be made to a deputy.—See *The Life and Death of Sir Henry Vane, Knight* (London 1662); Birch's *Lives;* and Ludlow's *Memoirs.*

VANG, n. *văng* [Dut. *vangen;* Ger. *fangen,* to seize]: a rope passing from the extremity of a gaff to the rail on each side of a ship, for the purpose of steadying the spar.

VANGUARD: see under VAN 1.

VANILLA, n. *vă-nĭl'lă* [Sp. *vainilla,* a small pod or husk—from *vaina,* a scabbard or sheath—from L. *vagīna,* a scabbard—so called from the pod resembling the sheath of a knife]: a genus of plants, or a member of the genus, natives of Asia and of tropical Amer., the pods or fruit of which produce a delightful aromatic, used extensively in flavoring liqueurs, chocolate, ices, and articles of confectionery; the produce of the *Vanilla planĭfolĭa* and *V. aromatĭca,* ord. *Orchidăcĕæ.* VANILLIN, n. *vă-nĭl'lĭn,* the odoriferous principle of vanilla.—*Vanilla* as a genus consists of parasitical *Orchideæ,* which spring at first from the ground, and climb with twining stems to the height of 20 or 30 ft. on trees, sending into them fibrous roots produced from nodes, from which the leaves also grow. These roots, drawing sap from the trees, sustain the plant, even after the principal root has been destroyed. The stem is four-cornered and juicy; the leaves long and fleshy. The flowers are in spikes, and are very large, fleshy, and generally fragrant. The fruit is a pod-like, fleshy capsule, opening along the side. The *Vanilla* of commerce was formerly supposed to be the fruit of *V. aromatica,* native of tropical Amer., but is now ascertained to be chiefly, if not wholly, the fruit of *V. planifolia,* a species indigenous to Mexico, Guiana, Brazil, Peru, etc., and cultivated also in some W. India islands, the Mauritius, and Ceylon. The fruit is cylindrical, about a span long, and less than half an inch thick. It is gathered before fully ripe, dried in the shade, and steeped in a fixed oil, generally that of the cashew-nut. It contains within its tough pericarp a soft black pulp, in which many minute black seeds are imbedded. V. appears in commerce in packets of 50–100 pods, wrapped in cane-leaves and sheet-lead, or in small tin boxes. It has a strong, peculiar, agreeable odor, and a warm, sweetish taste. The interior pulp is the most aromatic part. Benzoic acid is sometimes so abundant in it as to effloresce in fine needles. V. is of little use in medicine, though it is a gentle stimulant and promotes digestion, and in large doses is said to be a powerful aphrodisiac; but it is much used by perfumers, and for

flavoring chocolate, pastry, sweetmeats, ices, and liqueurs. Balsam of Peru is sometimes used as a substitute for it. It is in very general use in S. America. Several kinds are distinguished in commerce. The best is that called *Leg* or *Lec*, almost black, and covered with crystals of benzoic acid. Another kind, less fragrant, drier, and of darker color, is known as *Simarona*. A still inferior kind, with much broader, brown capsules, is called *Pompona* or *Bova*. When the fruit of V. is fully ripe, a liquid (*Baume de Vanille*), unknown in Europe, but valued in Peru, exudes from it.

VANISH, v. *văn'ĭsh* [L. *vanesco*, I pass away—from *vānus*, empty (see VAIN)]: to pass from a visible state; to disappear. VAN'ISHING, imp. VAN'ISHED, pp. *-ĭsht*. VANISHING POINT, that part of a picture to which all the imaginary lines of the perspective converge.

VANITY: see under VAIN.

VANITY FAIR, n. *văn'ĭ-tĭ fär:* a fair described by Bunyan in his *Pilgrim's Progress*, established by Beelzebub, Apollyon, and Legion, for the sale of all sorts of vanities: *figuratively*, the most alluring temptations of the world.

VAN LENNEP, *văn lĕn'nĕp*, HENRY JOHN, D.D.: missionary: 1815, Mar. 8—1889, Jan. 12; b. Smyrna, Asia Minor, where his father was Swedish consul. Coming to America 1830, he graduated at Amherst College 1837, then studied a year at Andover Theol. Seminary, and returned to Asia as an ordained missionary of the Amer. Board. He established several missionary stations in European and Asiatic Turkey; later was connected with several important educational institutions in the Turkish empire, and travelled much in the East. He was notable for fervor, devotedness, and efficiency in missionary labor. He lost his sight 1869, and returned to the United States. Dr. V. L. wrote *Travels in Asia Minor*, and *Bible Lands*.

VANLOO, *vŏng-lō'*, CHARLES ANDRÉ: French portrait-painter: 1705, Feb. 15—1765, July 15; b. Nice; younger brother of Jean Baptiste V., with whom he studied at Rome, and with whom he went to Paris 1719, where, after brief employment as decorative artist at the opera-house, he betook himself to portrait-painting. He returned to Rome 1727, and there executed some works which laid the basis of his future reputation, and procured him, through the influence of Cardinal de Polignac, a pension from the king of France, and from the pope, 1729, the title of Cavaliere. In Turin he painted for the king of Sardinia a series of subjects from the *Jerusalem Delivered* of Tasso; and he returned to Paris 1734. The year following he was made a member of the Acad. His subsequent career was one of full prosperity. Tempting offers were made him by Frederick the Great; but he declined them, preferring to remain in Paris. In 1751 he was made a knight of the order of St. Michael by Louis XV., and became director of the Acad. In 1762 he was made chief painter to the king. He died at Paris.

VANLOO', JEAN BAPTISTE: French painter: 1684, Jan. 14—1745, Dec. 19; b. at Aix in Provence. His grandfather and father were both painters of some talent, and V. is said to have attained considerable proficiency as an artist while still a boy. He settled at Nice, and afterward at Toulon. When Toulon was besieged by the Duke of Savoy 1707, he returned to his native place. Visiting Turin 1713, he won the favorable regard of the Prince of Carignano, son-in-law of the Duke of Savoy, and was sent by him to study at Rome. In 1719 he went to Paris, where he speedily acquired great reputation as a portrait-painter. He was made a member of the Acad. 1731, and prof. of painting 1735. The loss of a large sum of money in the Mississippi Scheme induced him (1738) to go to London, where his portraits soon distanced all rivalry. His health, however, having given way, he retired 1742 to Provence, his native district, where he died. Though eminent chiefly in portrait-painting, V. had considerable talent as a painter of historical subjects.

VANNES, *vân:* seaport-town of France, cap. of the dept. of Morbihan; at the mouth of the Vannes, which falls into a narrow inlet of the Gulf of Morbihan; 310 m. w.s.w. of Paris by railway. The town is surrounded by high walls flanked with towers. The cathedral is the most important edifice. Manufactures of linen and woolen cloth and ship-building to some extent are carried on, as well as commerce in honey, wax, wine, and hemp.—Pop. (1881) 16,667; (1886) 20,036; (1901) 23,000.

VANNUC'CI, PIETRO: see PERUGINO.

VAN OOSTERZEE, *vân ōs'tĕr-zā,* JAN JAKOB, D.D.: Dutch theologian: 1817, Apr. 17—1882, July 29; b. Rotterdam, Netherlands. He studied theology at Utrecht Univ. 1835–40; then held pastorates, having charge of the principal chh. in Rotterdam 1844–62. Thereafter till his death he was prof. in Utrecht Univ., lecturing on biblical, systematic, and pastoral theology and homiletics till 1867, thereafter on the New Test. and the philosophy of religion. Dr. V. O. was a man of deep thought and spiritual fervor, and a leading advocate of the evangelical theology. His works are many; and some have been translated into English—viz., *The Image of Christ; Theology of the N. T.; Year of Salvation; Practical Theology.*

VANQUISH, v. *văng'kwĭsh* [F. *vaincre,* to subdue; from L. *vincĕrĕ,* to conquer, to overcome]: to subdue in a contest; to overcome; to confute; to overpower. VAN'QUISHING, imp. VAN'QUISHED, pp. *-kwĭsht.* VAN'QUISHABLE, a. *-ă-bl,* that can be vanquished. VAN'QUISHER, n. *-ĕr,* a conqueror. VAN'QUISHMENT, n. *-mĕnt,* in *OE.,* defeat. THE VANQUISHED, those defeated in any contest.—SYN. of 'vanquish, v.': to conquer; surmount; subjugate; silence.

VANQUISH, n. *văng'kwĭsh:* a disease in sheep in which they pine away; also spelled VINQUISH.

VAN RENSSELAER, *văn rĕns'sĕh-lĕr*, CORTLANDT, D.D.: Presbyterian clergyman: 1808, May 26—1860, July 25; b. Albany, N. Y.; descendant of Killian V. R. (q.v.). He graduated at Yale 1827; studied theol. in Union Theol. Sem. and elsewhere; was missionary to slaves in Va. 1833–35; ordained minister 1835; became a Presb. pastor in Burlington, N. J., 1837, and in Washington, D. C., 1841. As agent to collect money for Princeton Theol. Sem. 1844, he collected $100,000. He held office in various boards of management in the Presb. Chh.; founded the *Presb. Magazine;* and spent in promoting benevolent works much of his large patrimony.

VAN RENS'SELAER, HENRY KILLIAN: soldier: 1744–1816, Sep. 9; b. near Albany, N. Y.; great-great-grandson of Killian V. R. (q.v.). In the revolutionary war he commanded a N. Y. regt., and was wounded at the capture of Burgoyne: he carried a musket bullet in his body 35 years. His command was attacked by a strong British force at Ft. Ann 1777, July, and made a gallant defense till the abandonment of Ft. Ticonderoga was announced, when V. R. withdrew, again severely wounded.

VAN RENS'SELAER, KILLIAN or KILIAEN: great land-owner: 1595–1644; b. Amsterdam, Netherlands. He was a diamond-merchant in Amsterdam and was a member of the Dutch W. India Co., whose enterprises he forwarded by loaning his credit and by placing ships at the company's disposal. He 'purchased' from the aboriginals of the colony of New Netherlands a great tract of land extending on the w. bank of the Hudson river 12 m. s. of the present site of Albany, and 'stretching two days into the interior,' and then all the land on the e. side of the Hudson n. and s. of the same site and 'far into the wilderness.' This estate, comprising the modern counties of Albany, Columbia, and Rensselaer, took the name of Rensselaerswyck. V. R. never visited America: he managed his vast possessions through an agent. His descendants retained ownership of the manor till 1839, when Stephen V. R., 9th 'patroon,' sold his townships to his tenants, who had conspired to refuse payment of rents. See PATROON.

VAN RENS'SELAER, MARIANA (GRISWOLD): author: b. New York, 1851, Feb. 23; dau. of George Griswold, of New York. She became wife of Schuyler V. R., of New York, 1874. She has gained the repute of an exceedingly discriminating critic of architecture—keen yet appreciative—by her many articles in the *Century* magazine and other periodicals on architecture and fine art; and has published *American Etchers*, and *Henry Hobson Richardson and His Works*.

VAN RENS'SELAER, STEPHEN; known as 'the Patroon': statesman and patron of learning: 1769, Nov. 1—1839, Jan. 26; b. New York; fifth in descent from Killian V. R., the original patroon or proprietor of the Dutch colony of Rensselaerswyck, who in 1630, and subsequently, purchased a tract of land near Albany, 48 m. long by 24

wide, extending over three counties. V. R. was educated at Princeton and Harvard colleges, and married a daughter of Gen. Philip Schuyler (q.v.). Engaging early in politics, which in his time were the pursuit of men of the highest social position, he was elected to the state legislature 1789, and to the state senate 1795; and became lieut.-gov., pres. of a state convention, and canal commissioner. Turning his attention to military affairs, he was, at the beginning of the war of 1812, in command of the state militia, and led the assault on Queenstown; but the refusal of a portion of his troops, from constitutional scruples, to cross the Niagara river, enabled the British to repulse the attack, and Gen. V. R. resigned in disgust. As pres. of the N. Y. board of canal commissioners for 15 years he promoted the state system of internal improvements; as chancellor of the state univ., he presided over educational reforms; and as pres. of the agricultural board aided to develop the resources of the state. At his own cost he employed Profs. Eaton and Hitchcock to make agricultural surveys, not only of his own vast estates, but of a large part of N. Y. and adjacent tracts in New England —publishing the results 1824; he also paid the expenses of popular lectures on geology through the state. In 1824 he established at Troy an institution for education of teachers, with free pupils from every county—reorganized 1849 as the Rensselaer Polytechnic Institute (q.v.). Widening the sphere of his political interests, he went to congress 1823, and served several terms, exerting a powerful influence, and furthering the election of John Quincy Adams as president. After an active, useful, and honorable career, he died at Albany.

VAN SCHAICK, *văn skoyk*, GOZEN: soldier: 1737–87, July 4; b. Albany, N. Y. In the old French war, in the skirmish with French and Indians at Crown Point 1756, he was a lieut.; he was in the expeditions against Ft. Frontenac and Ft. Niagara; became maj. 1759; was seriously wounded in the battle of Ticonderoga. He was appointed commander of the 1st N. Y. battalion 1775, Nov., and the same year rendered good service in an expedition to Cherry Valley against the chief Joseph Brandt. He was brig.gen. at the battle of Monmouth; and commanded a detachment, 1779, which destroyed the settlements of the Onondagas.

VANTAGE, n. *văn'tāj* [contracted from ADVANTAGE, which see]: superiority; state in which one has better means of action or defense than another: V. in *OE.*, to gain or profit. VANTAGE-GROUND, the place or condition which gives one the superiority over another.

VANTBRACE, n. *vănt'brās* [F. *avant*, before; *bras*, arm]: in *OE.*, armor for the forearm and hand; also VAMBRACE (q.v.).

VAN VEEN, *vân vān*, OTHO (called also OTTOVENIUS): eminent painter: about 1556—about 1634; b. Leyden, of which city his father was a wealthy burgomaster. He received a careful education. When about 15 years old he was sent to Liége, whence, after three years, he proceeded to Rome, and remained in Italy about 8 years. Declining tempting invitations to settle in Vienna, Munich, and Cologne, he went to reside at Brussels, as painter to Alexander Farnese, Duke of Parma and gov. of the Spanish Netherlands. Later he opened an acad. at Antwerp, at which Rubens was one of his pupils. The new gov., Archduke Albert of Austria, appointed V. V. master of the mint at Brussels, to which city he returned; and there he died.—His chief works are religious pictures for churches, as seen in the cathedrals of Leyden, Antwerp, and Bruges.

VAN WERT, *văn wĕrt:* city, cap. of Van Wert co., O.; on the Pittsburgh Fort Wayne and Chicago, and the Cincinnati Jackson and Mackinaw railroads; 33 m. e.s.e. of Fort Wayne. It is in a lumber region, and has several saw and planing mills, and manufactories of woolen goods, staves, and wagons. In 1900 there were 10 chs., several union schools, co. court-house (cost $120,000), 2 national banks (cap. $160,000), and 1 daily and 2 weekly newspapers.—Pop. (1880) 4,079; (1900) 6,422.

VAN WYCK, *văn wīk*, ROBERT A.: lawyer: 1850—— ——; b. New York; descended on paternal side from Dutch ancestors who came to America 1650. In 1872 he graduated at Columbia Coll. law school; practiced law in New York until 1889, when he was elected to the bench of the city court, and later became chief-justice of that court. He was nominated for mayor of the city of New York by the democratic city convention 1897, Sept. 30, and was elected Nov. 2, receiving 228,688 votes, a minority of the whole vote, but a plurality of 80,105.

VAPEREAU, *vâ-prō'* or *vâ-pĕh-rō'*, LOUIS GUSTAVE: author: b. Orleans, France, 1819, Apr. 4. He entered the École Normale to fit himself to teach philosophy, and 1842 became private sec. to Victor Cousin, whom he assisted in editing Pascal's *Pensées*. He was prof. of philosophy at Tours 1843–53, and at the same time director of the German classes. He studied law in Paris 1852–54, and began to practice, but became editor of the *Dictionnaire des Contemporains* (1st ed. 1858), and has ever since held that post. He was appointed by the govt. inspector-gen. of public instruction 1877; decorated with the cross of the Legion of Honor 1878.

VAPID, a. *văp'ĭd* [L. *vapĭdus*, flat or stale; *vappa*, palled flat wine: allied to *vapor*, steam, exhalation]: that has lost its life and spirit, as by evaporation; spiritless; flat; dull; mawkish; insipid. VAP'IDLY, ad. *-lĭ*. VAP'IDNESS, n. *-nĕs*, or VAPIDITY, n. *vă-pĭd'ĭ-tĭ*, want of life or spirit; deadness; flatness.

VAPOR, n. *vā'pĕr* [F. *vapeur*—from L. *vapor* or *vapōrem*, steam, exhalation]: the elastic aeriform fluid into which most liquids and many solids may be converted by heat, generally invisible; a visible fluid floating in the atmosphere; *figuratively*, something vain or unsubstantial: V. to be exhaled; give out vapor or steam; boast; to brag; to bully. VA'PORS, n. plu. *-pĕrz*, in *OE.*, a name given to a disease characterized by nervous weakness and depression of spirits, in which a variety of strange images float in the brain or appear as real and visible; hysteria; also, a name applied to the empty boasts and talk of a bully. VA'PORED, a. *-pĕrd*, moist; in *OE.*, peevish. VA'PORER, n. *-pĕr-ĕr*, one who makes a vaunting display of his prowess or worth; a braggart. VA'PORING, a. boasting ostentatiously. VA'PORISH, a. *-ĭsh*, affected by hysterics or the disease called vapors. VA'PORISHNESS, n. *-nĕs*, the state or quality of being vaporish. VA'PORY, a. *-ĭ*, full of vapors; in *OE.*, peevish. VA'PORABLE, a. *-ă-bl*, capable of being converted into vapor. VA'PORABIL'ITY, n. *-ă-bĭl'ĭ-tĭ*, quality of being vaporable. VA'PORIZE, v. *-īz*, to convert into vapor. VA'PORIZING, imp. VA'PORIZED, pp. *-īzd*. VA'PORIZA'TION, n. *-ī-zā'shŭn*, the rapid conversion of a fluid into vapor by heat. VA'POROUS, a. *-ŭs*, of or pert. to vapor; full of vapors or exhalations; proceeding from the disease called vapors. VA'POROUSNESS, n. *-nĕs*, state of being vaporous. VA'PORIF'EROUS, a. *-ĭf ĕr-ŭs* [L. *fero*, I bear]: bearing or forming vapor. VA'PORIF'IC, a. *-ĭf'ĭk* [L. *facĕrĕ*, to make]: that converts or has the power of converting into vapor or steam. VAPOR-BATH, the application of vapor to the body in a close place; the bath itself.—A *Vapor* is really a gas. As all *solids* except carbon (an exception due probably to our inability to produce a sufficiently high temperature) are melted, or rendered *liquid* by Heat (q.v.), so a further application of heat converts them into *vapor* or gas. That a vapor is a gas is best shown, perhaps, by the beautiful experiments of Faraday (q.v.) and others on the liquefaction of gases. Hydrogen, oxygen, and nitrogen long were exceptions; but now all gases have been liquefied by a proper application of pressure or cold, or of cold and pressure combined. The difference between a V. and a gas, as these words are used in common speech, is this: a gas is a substance which at ordinary temperatures and pressures exists in a state of vapor, while a V. is produced by application of heat to a substance found ordinarily in the solid or liquid form; in other words, gases are the vapors of substances which, in their liquid form, boil at very low temperatures.

The most familiar instance of V. is aqueous V., or Steam (q.v.). At all temperatures, even as low as the freezing-point, ice and water give off V., and the quantity produced is determined by the temperature alone—i.e., Evaporation (q.v.) at any temperature continues (more or less slowly according to the quantity of air or other gas which is present) until the pressure exerted by the V. on the containing vessel attains a certain definite value, depending on the temperature alone. If the temperature be such that

the corresponding vapor-pressure is equal to the pressure of the air, V. comes off freely, and we have the phenomenon called boiling.

V. in a vessel which contains some unevaporated water is thus always *saturated*—i.e., the full amount of V. capable of existing at the temperature of the vessel is present. If it be compressed, some is liquefied; if allowed to expand, more V. is formed. If, however, there be no water present in the liquid form, and the temperature be gradually raised the pressure of the V., will rise, but much more slowly than when water is present, because no more V. can be formed: in this state, that of *superheated* steam, V. behaves almost exactly as an ordinary gas.

Chlorine, carbonic acid, sulphurous acid, etc., thus exist at ordinary temperatures as *superheated* vapors; and can therefore be reduced by cold and pressure to the condition of *saturated* V., when they are easily liquefied by carrying the process further.

Aqueous V. may be liquefied by cold alone, or by pressure alone, as we have seen: and at ordinary temperatures it is easy to liquefy sulphurous acid, ammonia, and even carbonic acid and laughing-gas, by mere compression. Gases absorbed by charcoal or by spongy platinum—i.e., condensed by intense molecular forces on the large surface presented by the interstices in these bodies—must in all probability exist in the state of liquids. Carbonic acid is liquefied when exposed to a pressure of 35 atmospheres at ordinary temperatures; and some varieties of charcoal absorb from 80 to 100 times their bulk of this gas. Remembering that, on account of the impenetrability of matter, the gas can be only in the *pores* of the charcoal, and that their whole bulk is but a small fraction of that of the charcoal itself, we see that probably the absorbed gas must be condensed so enormously as to have become liquid. It is probable that, in Graham's process for separating by dialysis (see OSMOSE) the oxygen and nitrogen of the atmosphere, the film of vulcanized India-rubber employed as septum compels these gases to pass through its pores in a liquid form.

Experiments by Cagniard de la Tour (inventor of the SIREN—q.v.) have given valuable information on the subject of vapors. He showed that when water, ether, and other liquids are hermetically sealed in glass tubes, so as to fill from a quarter to a half of the tube, the application of the requisite amount of heat is sufficient to convert the whole into V.: this V., therefore, has a density equal to half or quarter of that of the liquid. Ordinary steam from boiling water has only about $\frac{1}{1700}$ of the density of water (in common language, a cubic inch of water gives a cubic ft. of steam). These experiments are very dangerous. Some important experiments of this nature are due to Andrews. Having, by mere pressure, partially liquefied carbonic acid in a glass tube, he raised the temperature gradually, and observed that the demarkation between the liquid and the gas became less and less definite, the capillary curvature of the surface of the liquid also diminish-

ing. At about 88° F. the liquid surface became horizontal, and the liquid disappeared. The tube then appeared filled with a homogeneous substance, neither gaseous nor liquid—apparently a new state of matter. When the temperature was slightly diminished, or the pressure relaxed, there was a singular appearance of flickering striæ, like those on mixing alcohol and water, or on looking through the column of irregularly heated air rising from a hot body. No pressure that Andrews could apply, not even 400 atmospheres, could liquefy this gas when its temperature was above 88° F. It appears that for every gas there is a point of temperature above which it is impossible by any amount of pressure to liquefy it.

The so-called permanent gases, oxygen, hydrogen, and nitrogen, through the patience and skill of Pictet of Geneva and Cailletet of Paris, have been liquefied or even solidified. Oxygen has been liquefied under a pressure of 500 atmospheres; hydrogen, under a pressure of 280 atmospheres; nitrogen, under a pressure of 200 atmospheres.

VAPOR-ENGINE: modification of the gas-engine, the power being produced by explosions of an inflammable vapor. The V.-E. is operated by vapor drawn into the cylinder by the suction of the piston, and ignited by an electric spark. The process is as follows: a vessel called the carburetter contains a small quantity of gasoline, and is connected with the cylinder by a pipe. At each revolution of the fly-wheel a current of cool air is drawn through the carburetter and into the cylinder. In passing through the carburetter it vaporizes a quantity of the gasoline; this, when mixed with more air drawn through the pipe and air-valve, forms the charge which, on combustion, develops the power. This charge is drawn into the cylinder as the piston is drawn out by the crank and fly-wheel; on the return-stroke it is compressed in the head of the cylinder, and just before the piston arrives at its highest point, or 'upper dead-centre,' a shoulder or point projecting from it (which is an electrode) comes in contact with a flexible piece (also an electrode), the two comprising the poles of a small battery, thus completing an electric circuit, which is broken just as the piston, having passed its 'centre,' begins to descend. At the instant when the electrodes separate, the spark is emitted, firing the charge. On every other stroke of the piston this is repeated automatically, except when the supply is cut off by the governor, which not only controls the engine, but at the same time cuts off the supply of vapor, so that when less power is being used proportionately less gas is consumed. With such an engine there is no fire-risk.

VAQUERO, n. *vä-kā'rō* [Sp., a cowherd—from *vaca*, L. *vacca*, a cow]: a term applied in Mexico and the western states to one who has the charge of cattle, horses, or mules; a herdsman.

VAR, *vâr:* dept. in the extreme s.e. of France; bounded s. and s.e. by the Mediterranean, n.e. by the dept. of Alpes Maritimes (q.v.); 2,348 sq. m. The dept., formed 1790 of part of Provence, receives its name from the river Var, formerly its e. boundary, but since 1860 belonging wholly to the dept. of the Alpes Maritimes. Var is well watered by numerous streams, of which the chief are the Gapau, Argens, and Bianson. In the n. and n.e. it is mountainous, being traversed by a branch of the *Alpes de Provence*, called the Monts de l'Esterel. Between the mountains the water-courses give great fertility to many valleys. The climate, tempered by the altitude of the surface, is pleasant. Fruits of all kinds thrive; tobacco is grown; and the vine is extensively cultivated. The yield of wine 1884 was more than 7,000,000 gallons (reduced by the phylloxera from an average in the previous 10 years of about 29,000,000 gallons). There are numerous potteries. The dept. abounds in minerals. Commerce is active; exports being chiefly wine, fruits, olive-oil, and other agricultural and horticultural products. Var is divided into the three arrondissements, Draguignan, Brignoles, and Toulon: cap. Draguignan.—Pop. of dept. (1901) 326,380.

VARA, n. *văr'a:* a Spanish-American lineal measure, equal to about 32 or 33 inches.

VARANGIANS, *va-răn'jĭ-anz* (Ger. *Waräger* or *Wäringer*): Norman people of the Baltic coast, who in the 9th c. ravaged the coasts of the Baltic, and repeatedly subjugated the Slavic and Finnish peoples of n. and central Russia. They forced the Krivitches, Tschudes, and other tribes to pay tribute, and wrested from the Russians the districts now known as Revel, Petersburg, and Archangel. Gradually the two nations became intermixed, and the names Russian and Varangian appear to have been considered synonymous. In 862 the rulers of this Russo-Varangian nation, Rurik (q.v.), Sineous, and Truvor, were invited by the federative state of Novgorod, in which the Slavs were dominant, to put themselves at its head; and Rurik, accepting the invitation, founded the Russian monarchy: see RUSSIA. The V. were at first distinguishable in various ways above the other peoples of the Novgorod state; but, being far inferior in numbers, were soon forced to adopt the Slavic tongue, conform to Slavic manners, and so become merged in the predominant population. The great success which attended this experiment of the Novgorod confederacy induced other Slavic states, on the Dnieper, to put themselves under protection of the warlike V.; accordingly we find a second Slavic state at Kiev, under the rule of Oskold, a Varangian chief, conqueror of the barbarous Chazars. After Rurik's death, his successor in power, the regent Oleg, united Kiev to Novgorod, making Kiev the cap.—which position it held till supplanted by Moscow (q.v.).

VARANIDÆ, *va-răn'ĭ-dē:* family of saurian reptiles, having a very elongated body, without dorsal crest; strong legs and long unequal toes; tail long and slightly com-

pressed; scales tuberculous and arranged in rings, tongue protractile, dividing into two points as in serpents. They belong to the sub-order *Pleurodonta*, and are confined to the e. hemisphere. Some are aquatic, and some inhabit dry and sandy places. The terrestrial species have the tail conical, the aquatic species compressed and often crested, so that it becomes a powerful organ of locomotion in water. The motion of the terrestrial species is aided by the tail, and is always serpentine. Some of the V. attain large size. They feed on animal food of any kind. The most noted species is the Monitor of Egypt, 5–6 ft. in length when of maximum growth; but, as usually seen, much less.

VARAZZE, *vâ-râť sā:* small town of n. Italy, on the Gulf of Genoa; 18 m. s.w. of the city of Genoa. Many fishing-boats are constructed here.—Pop. of town 5,000.

VAREC, n. *văr'ĕk* [F. *varech* (see WRACK 1)]: in the *Channel Islands*, sea-weeds dried and burned, or the carbonate of soda obtained therefrom; kelp.

VARESE, *vâ-rā'sā:* town of n. Italy, province of Como; 13 m. w. of the town of Como. It is a handsome town, with several fine palaces and magnificent villas; and manufactures silk, cotton, paper, and hats. V. is of very ancient origin. The Romans kept it strongly garrisoned as a stronghold against invasion from the north.—Pop. 12,600.

VARIABLE, VARIANCE, VARIANT, VARIATION, etc.: see under VARY.

VARICELLA, n. *văr'ĭ-sĕl'lă* [a dim. from *variŏla*, the smallpox]: the Chicken-pox (q.v.).

VARICK, *văr'ĭk*, RICHARD: soldier: 1753, Mar. 25—1831, July 30; b. Hackensack, N. J. At the beginning of the revolutionary war he was practicing law in New York, but then became capt. in an infantry regt.; subsequently he was sec. to Gen. Philip Schuyler, at whose instance congress appointed V. deputy muster-master-gen. 1776, with rank of lieut.col. The office of muster-master was abolished after the capture of Burgoyne, and V. became inspector-gen. at West Point and Gen. Benedict Arnold's 1st aide-de-camp. Intelligence of Arnold's treason was a grievous shock to V. Thereafter he was recording sec. to Gen. Washington till near the close of the war. He held many municipal offices in New York, and was N. Y. atty.gen. 1791–1801, and speaker of the N. Y. assembly 1787.

VARICOCELE, VARICOSE: see under VARIX.

VAR'ICOSE VEINS: veins in permanent state of dilatation in some part of their course—the dilatation itself being called a *Varix* (q.v.). Some veins seem unaffected by varices, which, however, are frequent in the submucous veins of the rectum (constituting hemorrhoids or piles), in the spermatic veins, giving rise to Varicocele (q.v.), and in the veins of the lower extremities. They are occasionally (but very rarely) found in other veins. Certain conditions of the system favor the formation of varices, among which are an indolent temperament and a

debilitated condition of the general system, accompanied by a relaxed state of the walls of the veins; possibly also a congenital predisposition or hereditary tendency in persons whose occupation involves much standing or walking. Cooks, washerwomen, and foot-soldiers are instanced as specially prone to varicose veins. Varices may occur at almost any period of life, but are developed chiefly during middle age. Their formation is aided by any condition of the system which impedes the circulation, as certain diseases of the heart, lungs, and liver; and by continued *high living*, which is especially liable to induce hemorrhoids.

Varices occurring in the leg usually cause deep-seated aching pain in the limb, with sense of weight, fulness, and numbness, before there is any external appearance of the affection. In a more advanced stage the ankles swell in the evening, and the feet are always cold. After a time a small tumor of bluish tint appears, which disappears on pressure, but returns on removal of the pressure, and is caused by a dilating vein. This dilatation extends, and forms knotty, irregular tumors, soft to the touch, diminishing on pressure or on the patient's assuming a horizontal posture, and giving a bluish tint to the adjacent skin. These tumors occur usually in the middle of the leg, along the track of the saphena veins, but they often extend along the whole leg and thigh. Old varices cannot be cured, except by operations dangerous to life, though much may be done for their relief; but V. V. in their earlier stages are amenable to treatment. The venous circulation of the limb should be as much as possible facilitated by disuse of garters; by keeping the limb (if possible) in a horizontal position for a month or six weeks; by refraining from walking, and by taking only carriage-exercise, with the leg in horizontal position. The limb should also be carefully bandaged from the toes to above the knee; the bandage being replaced daily, and the limb then well rubbed with the hand, or with a flesh-brush, for ten minutes or more, from below upward, to stimulate the circulation. When the circumstances of the patient hinder this treatment, elastic stockings may be tried during the day, or ordinary bandages, with a pad of lint placed on each varicose cluster before the bandage is applied. In cases where only one or two trunks are affected, the disease may be prevented from extending by application of pieces of wash-leather spread with soap-plaster firmly over them. Attention must be given to the general health. Ill-nourished, feeble patients must be treated by tonics and nourishing diet; while overfed, plethoric patients require mild but frequent purgatives to relieve the portal circulation. In the numerous cases in which there is a relaxed condition of the veins, the tincture of sesquichloride of iron may usually be given with advantage in half-dram doses thrice daily in half a tumbler of water, with a colocynth pill every second night, to obviate the constipating action of the iron. Among the means of effecting a *radical cure*, by causing coagulation of the blood in the dilated veins, when they shrink and contract permanently, are (1) caustic

potash applied over the course of the vessel, (2) subcutaneous incision of its walls, and (3) compression of the vessel between a steel pin and a twisted suture. Probably the cases are rare in which the pain of the V. V. is so great as to disqualify a patient from his ordinary work; and these cases are the only ones in which resort should be had to any of the above operations; in all other cases the patient should be content with simple palliative measures.—Among troublesome consequences of V. V. are the obstinate ulcers, known as varicose ulcers, to which they give rise; and it must be borne in mind that occasionally, when the skin has been thinned by prolonged pressure, the varices burst through it, inducing hemorrhage, which, if not promptly stopped, may cause fainting, and even death. When such an accident occurs, the patient should at once be placed in a horizontal position, and the leg raised, which will usually stop the bleeding. If bleeding continue, a pad of lint must be pressed upon the mouth of the bleeding vessel by means of a few turns of a bandage round the limb.

VARIEGATE, v. *vā'rĭ-ĕ-gāt* [L. *varĭĕgātus*, pp. of *varĭĕgārĕ*, to make of various sorts or colors—from *varĭus*, various; *agĕrĕ*, to make]: to diversify in external appearance; to stain or inlay with different colors or different shades of the same color. VA'RIEGATING, imp. VA'RIEGATED, pp. VA'RIEGA'TION, n. *-gā'shŭn*, the act or process of variegating; the state of being diversified by different colors. VA'RIEGATOR, n. *-tĕr*, one who or that which variegates.

VARIETY: see under VARY.

VARI'ETY, in Natural History: a group subordinate to a Species (q.v.); usually distinguished by differences of proportion in parts, or of color, less important than those that distinguish species, and more local. Some varieties are quite local; others, more widespread, seem dependent on climate or the character of the country. Thus, there are southern varieties of species of birds, with smaller bodies and larger bills and feet; and western varieties, with paler plumage. The difference, however, must be sufficiently marked and persistent; otherwise it is not a V., but only the variation that abounds among individuals. If a series of intergrading forms is found, the term V. is not technically applied, nor even the term species, though the word V. may be used for convenience. Those who adopt Darwin's view of species do not attach importance to the distinction between species and varieties, but consider varieties as species in process of formation. On whatever view, the subject is involved in difficulty.—See SPECIES.

VARINAS, *vâ-rē'nâss*, or BARINAS, *bâ-*: town of Venezuela, on the San Domingo; 90 m. s.e. of the nearest shore of Lake Maracaybo; at the entrance to a valley covered with tobacco-plantations. V. has a trade in tropical productions and in cattle.—Pop. stated at 5,000.

VARIOLA, n. *vă-rī'ō-lă* [F. *variole*, smallpox—from L. *varĭus*, variegated, spotted]: the Smallpox (q.v.). VARI'OLAR, a. *-lĕr*, pertaining to or of the nature of the smallpox. VARIOLITE, n. *vā'rĭ-ō-līt*, compact amygdaloid or amygdaloidal porphyry in which the inclosed crystals are numerous, small, and round, giving to the rock a spotted appearance, rendered more striking from the rock being of a different color from the inclosed crystals. VA'RIOLIT'IC, a. *-lĭt'ĭk*, thickly marked with small round specks; spotted. VA'RIOLOID, n. *-loyd* [Gr. *eidos*, resemblance]: a disease resembling the smallpox; a modified or mild form of smallpox, which, though true smallpox, is seldom fatal: ADJ. resembling smallpox; measly. VARIOLOUS, a. *vă-rī'ō-lŭs*, or VARIOLIC, a. *vā'rĭ-ŏl'ĭk*, dotted with numerous small impressions like those of smallpox; relating to the smallpox.

VARIORUM, a. *vā'rĭ-ō'rŭm* [contracted from L. *cum notis varĭōrum*, with notes of various authors]: *literally*, of various persons or things; containing notes on the text by different authors, as a *variorum* edition of Shakespeare.

VARIOUS, VARIOUSLY: see under VARY.

VARIX, n. *vā'rĭks*, VARICES, n. plu. *vā'rĭ-sēz* [L. *varix* or *varĭcem*, a dilated vein; *vărĭcēs*, dilated veins—from *varus*, bent—so called from their crooked appearance]: a dilatation and convoluted state of the veins, accompanied with an accumulation of dark-colored blood (see VARICOSE VEINS): in *zool.*, the ridges or spinose lines marking a former position of the mouth in certain univalve shells. VARICOSE, a. *vā'rĭ-kōs*, in a permanent state of dilatation, with an accumulation of dark-colored blood; swelled—applied to veins. VARICOSITY, n. *vā'rĭ-kŏs'ĭ-tĭ*, state of being varicose. VARICOCELE, n. *vā'rĭ-kō-sēl'* [Gr. *kēlē*, a tumor]: a swelling or tumor of the scrotum, or a varicose state of the veins of the spermatic cord, caused by weakness of structure, combined with obstruction (as through corpulence, constipation, etc.) to the return of the venous blood.

VARLET, n. *vâr'lĕt* [OF. *vaslet* or *varlet*, a boy, a page (see VALET)]: *originally*, a youth of noble or knightly birth serving as an apprentice-knight; hence, a page; a servant or footman; *now*, a low fellow; a scoundrel; a rascal. VAR'LETRY, n. *-rĭ*, the rabble; the crowd.

VARNA, *vâr'nâ:* important fortified town and seaport of the principality of Bulgaria, on the n. side of a semicircular bay, inlet of the Black Sea; 180 m. n.n.w. of Constantinople, midway between the Bosphorus and the Danube delta. The Congress of Berlin 1878 decided that the strong fortifications by which the port was formerly defended should be destroyed. V. stands on a sand-bank; and the city wall, whose base is in some places 20 or 30 ft. above sea-level, is in other places on a level with high water. The town itself is crooked, irregular, dirty, and dilapidated; and from the sea it presents a huge jumble of red-tiled houses, interspersed with mosques and minarets. Though the harbor of V. is exposed, there is considerable trade, the value of the imports (1887) amounting to nearly $2,900,000, and the exports to nearly $1,700,000. Pop. (1900) 33,443.

VARNHAGEN VON ENSE, *fär'hä-gĕn fŏn ĕn'sĕh*, KARL AUGUST LUDWIG PHILIPP: author: 1785, Feb. 21—1858, Oct. 10; b. Düsseldorf. He studied in the universities of Berlin, Halle, and Tübingen. He was in the Austrian army at Wagram 1809; was made prisoner by the French 1809; exchanged 1810, he joined the Prussian army 1813. He held responsible offices in the Prussian govt., but 1819 retired from public life. He was associated with Chamisso, Fouqué, and others in various periodical publications. Among his numerous writings is a valuable series of biographies. After his death was pub. his correspondence with Rahel Levin, who became his wife 1814; also the numerous letters written to V. by Alexander von Humboldt. His *Journals* fill 14 vols. A collection of his 'select works' is comprised in 19 vols.—viz., *Denkwürdigkeiten des Eigenen Lebens* (6 vols.): *Biographische Denkmale* (10 vols.); *Vermischte Schriften* (3 vols.).

VARNISH, n. *vär'nĭsh* [F. *vernis*, varnish—from mid. L. *vitrinus*, glassy—from L. *vitrum*, glass: It. *vernice;* Sp. *berniz, barniz*, varnish, paint]: a liquid resinous matter spread or used for spreading on a surface, to which it gives a glossy coating when dry, and which is thus rendered almost impervious to air or moisture; gloss: V. to cover with a liquid in order to give a glossy surface; to give a fair appearance to, as conduct; to gloss; to cover or conceal with something ornamental. VAR'NISHING, imp. VAR'NISHED, pp. *-nĭsht*. VAR'NISHER, n. *-ĕr*, one who or that which varnishes; one who glosses or gives a fair appearance to.—*Varnish* is a solution of some resinous material in any proper solvent, usually alcohol or oils. The solution must be of such consistency as to enable it to be very thinly and smoothly spread over the surface intended to be varnished, so that when it dries it leaves a thin resinous coating, which either is naturally glossy, or can be made so by polishing. From the extremely inflammable nature of the material employed, the preparation of varnish is extremely dangerous, and should be attempted only in premises specially adapted for the purpose, and with skilled workmen. The resinous gums, e.g., copal, anime, and mastic, and the various kinds of lac, are those chiefly used; the copals and anime are employed in making the oil-varnishes, and the lacs and gum mastic for spirit-varnishes. Heat is required with both kinds of solvents, the hot-water bath being the safest mode. Coloring matters are added to some varnishes, especially to those used on metal—e.g., the lacquer-varnish used to protect the polished surface of brass, which is colored with gamboge and turmeric. Saffron, aloes, dragon's blood, and asphalt also are used to give yellow, brown, red, and black colors.

VAR'NISH-TREE: any one of several trees of family *Anacardiaceæ*, whose resinous juice is used for varnish or for lacquer. For the BLACK V.-T. (*Melanorrhœa usitata*), see MELANORRHŒA: for the JAPAN V.-T. (*Rhus vernicifera*), see SUMACH. Another tree valuable for the varnish which it yields is *Stagmaria verniciflua*, native of

Java, Sumatra, Borneo, Celebes, and other E. India islands. Its juice is extremely acrid, and soon hardens into a black resin. To obtain it, pieces of bamboo are inserted into the bark, and allowed to remain all night, as the juice flows more freely by night than by day. It is prepared for use by boiling it with equal parts of oil, obtained from the fruit of the *Mimusops elengi.* The exhalations of the tree are said to be very noxious.

VARNUM, *vär'nŭm,* JAMES MITCHELL: soldier of the revolution: 1748, Dec. 17—1789, Jan. 10; b. Dracut, Mass. He graduated at Brown Univ. 1769; was admitted to the bar 1771, and settled in E. Greenwich, R. I.; became col. of the 1st R. I. infantry regt. 1775, and was present with his command at the siege of Boston, the affair at Harlem Heights, and the battle of White Plains. He became brig.gen. by commission of the gov. of R. I. 1776, Dec. 12, and attained the same rank in the continental army the next year. In command of his brigade, V. took part in many engagements; was at Valley Forge and in the battle of R. I. He was honorably discharged 1779, Mar. 5. He was member of the continental congress 1780–82 and 1786–7. He was appointed a judge of the Northwest Terr. 1787, and settled at Marietta, O.

VARRO, *vär'rō,* MARCUS TERENTIUS: 'the most learned of the Romans,' so called from his vast erudition in almost every department of literature: B.C. 116–27; b. in Reate, in the Sabine country. He was educated first under L. Ælius Stilo Præconinus, and afterward at Athens under Antiochus, a philosopher of the Academy. V. served with distinction in the wars against the Mediterranean pirates and Mithridates; but afterward, as legatus of Pompey in Spain, he was compelled to surrender his forces to Cæsar. He shared the fortunes of the Pompeian party till its defeat at Pharsalia; after which he solicited and obtained his pardon from Cæsar, by whom he was employed to collect and arrange the great library designed for the public. The next period in V.'s life was spent in literary retirement, chiefly at his villas near Cumæ and Tusculum. When the 2d triumvirate was formed, Antony enrolled his name in the list of the proscribed; but he succeeded in escaping, and, after some time in concealment, he was received under the protection of Octavian. The residue of his long life was given to tranquil prosecution of his favorite studies, rendered all the more arduous by the partial destruction of his magnificent library. V. was not only the most learned, but also the most prolific of Roman authors. He himself acknowledges the composition of 490 books; but only two have survived, one of them in a fragmentary state. The most considerable of his writings, lost or extant, are as follows: 1. *De Re Rusticâ, Libri III.*, extant, and, though written in the author's 81st year, constituting the most important treatise known to us on ancient agriculture. 2. *De Linguâ Latinâ*, a grammatical work, of whose original 24 books only 6 have come down to us, and even these in imperfect form. But for this treatise, mutilated as it is, we should be ignorant of many terms and forms, as well as of

much recondite information regarding the civil and religious usages of the ancient Romans. 3. *Sententiæ*, 165 pregnant sayings strung together, not by V. himself, but probably by different hands at different times. 4. *Antiquitatum Libri;* comprising two sections, *Antiquitates Rerum Humanarum*, 25 books, and *Antiquitates Rerum Divinarum*, 16 books. This, the greatest work of V., and on which mainly his reputation for learning was founded, has unfortunately perished, except a few fragments. From its 2d section, St. Augustine drew much of his renowned work, the *City of God.* 5. *Saturæ*, composed in various meters, and occasionally in prose: these pieces, copied to some extent from the productions of Menippus the Gadarene, were apparently a series of comments on a great variety of subjects, generally conveyed in dialogue, and aiming at enforcement of some moral lesson or serious truth in a familiar and even jocular style. Of the above works we have only fragments; and of the other works little more than the titles. The best ed. of *De Re Rusticâ* is that of Schneider (Leip. 1794–97); of *De Linguâ Latinâ*, that of Müller (Leip. 1833).—V.'s personality, as it appears in Cicero's *Letters*, is not attractive; he seems to have been reserved and severe—given to solid and profound learning, and not to literary style.

Another V., PUBLIUS TERENTIUS VARRO (cognomen ATACINUS), B.C. 82—about 37, was a Roman poet and translator.

'VARSITY, n. *vâr'sĭ-tĭ* [colloq.]: either Oxford or Cambridge universities, England, more rarely University College, Oxford; sometimes applied to other great universities.

VARSOVIENNE, n. *văr-sō'vĭ-ĕn'* [from *Warsaw*, it being originally a Polish dance]: a kind of dance.

VARTABAD, n. *vâr'ta-băd*, or VAR'TABED, n. *-bĕd*, or VAR'TABET, n. *-bĕt* [Armenian, *vartabad*, a doctor, i.e., a learned man]: an order of ecclesiastics in the Armenian Church, consisting of clerics with monastic vows; they are the only men under such vows. The bishops are appointed from the vartabads.

VARUNA, *vâ-rō'nâ*, mod. Hind. *vĕr'û-na* [Skr.—from *vr'i*, surround; hence, literally, 'the surrounder'= Gr. *Ouranos*, L. *Uranus* (q.v.)]: in the Vedic mythology of the ancient Hindus, one of the most prominent of the *Adityas*, or offspring of *Aditi*, the deity of space. He is often invoked with *Mitra*, sometimes with *Agni*, the god of fire, or with *Indra* (q.v.), or some other elementary deity. Originally V. seems to have been conceived as the sun from the time after its setting to that of its rise; while *Mitra* probably represented the sun at its rise. The night is therefore said to be V.'s, and the day Mitra's; and the 'ever-going V. grants a cool place of rest to all moving creatures, on the closing of the eye (of *Savitr'i*, the sun).' Out of the mysteriousness with which night is easily endowed, and the qualities which imagination may ascribe to the luminous origin of V., probably grew the moral

attributes of this deity; for he is extolled as the guardian of immortality; as the cherisher of truth; as armed with many nooses, with which he seizes evil-doers; as the forgiver of sins; as having unlimited control over mankind; as the protector of the good, and the punisher of the wicked. See VASISHT'HA: also Muir's *Contributions to a Knowledge of the Vedic Theogony and Mythology* in *Journal of the Royal Asiatic Soc.*, 1864.—In the R'igveda the passages are few (and perhaps not of an early period) in which V. is spoken of as lord of rivers and of the sea. It is in this latter character, however, that V. appears in the classical and Purânic mythology; for there, though he is still mentioned as an Âditya, his real quality is that of the regent of the waters, especially of the ocean. As such, he retains the Vedic qualities as 'lord of punishment.'—Later fiction makes him also the regent of the West, probably in recollection of his Vedic character as the setting sun; and endows him with a wife, *Varun'âni*, a son, and sometimes a daughter.

VARUS, *vā'rŭs:* in surgery, a variety of Club-foot (q.v.). The Latin word signifies 'having the legs turned inward, knock-kneed,' is therefore the opposite to Valgus (q.v.), and requires the word *Talipes* to be supplied, as in Valgus (q.v.). In the form of club-foot termed varus, (1) the heel is raised; (2) the inner edge of the foot is drawn upward; (3) the anterior part of the foot is twisted inward, so that the patient walks on its outer edge.

VARUS, *vā'rŭs*, PUBLIUS QUINTILIUS: Roman of noble birth who lived at the time of the Christian era. He was appointed gov. of Syria, and on his return was sent by Augustus to command the armies in Germany, with instructions to introduce into that country the regular administration of a Roman province. The indignant Germans, under the leadership of a chief of the Cherusci, named Arminius (Latinized from Herman), attacked V.; and after several days of fighting utterly routed the Roman army. V. killed himself in despair.—See HERMANN, or HERMAN.

VARVICITE, n. *vâr'vī-sĭt* [after the county of *Warwick*, where it is found]: an oxide of manganese.

VARY, v. *vā'rĭ* [L. *varĭārĕ*, to diversify—from *varĭus*, different, changing: F. *varier*, to vary]: to change to something else; to alter; to make different; to suffer a partial change; to diversify; to appear in different forms; to disagree; to deviate to be changeable; to change; to shift colors: N. in *OE.*, change; alteration. VA'RYING, imp. VA'RIED, pp. *-rĭd:* ADJ. various. VA'RIEDLY, ad. *-lĭ.* VARIABLE, a. *vā'rĭ-ă-bl* [F.—L.]: that may or can be varied or changed; fickle; changeable; unstable; inconstant; in *math.*, subject to continual increase or diminution: N. in *math.*, a quantity subject to continual increase or diminution. VA'RIABLES, n. plu. *-ă-blz*, the zone of calms and light breezes, formed by the trade-winds north and south of the equator for a certain distance neutralizing each other. VA'RIABLY, ad. *-blĭ.* VA'RIABLENESS, n.

-bĭl-nĕs, or VA'RIABIL'ITY, n. *-bĭl'ĭ-tĭ*, liability to alter or change; changeableness; fickleness. VA'RIANCE, n. *-rĭ-ăns*, disagreement; difference; controversy; dissension. VA'RIANT, a. *-rĭ-ănt*, different; diverse; changing: N. a thing which is a different form of another thing. AT VARIANCE, in a state of disagreement or enmity. VA'RIA'TION, n. *-ā'shŭn* [F.—L.]: alteration; partial change in form, appearance, position, etc.; change, as of termination; deviation; in *music*, one of the various embellishments which may be introduced into the singing or playing of an air; a transformation of a melody by melodic, harmonic, contrapuntal, and rhythmic changes. VARIETY, n. *vă-rī'ĕ-tĭ* [F. *variété*—from L. *varĭĕtas* or *varĭĕtātem*, difference, variety]: an intermixture of things different in form or quality; many and different kinds; a succession of different things; in *nat. hist.*, a subordinate division of a species, distinguished by some accidental or unimportant differences (see below): a different sort of the same species. VARIOUS, a. *vā'rĭ-ŭs*, diversified; different; manifold; changeable; unfixed. VA'RIOUSLY, ad. *-lĭ*. VA'RIABLE STARS, periodical stars; stars which vary in their lustre at different times. Compared with the enormous number of the stars, they are but few. One of the theories in regard to them is that an opaque body is temporarily interposed between the observer and the star, intercepting a part of its light. VARIATION OF THE COMPASS, the angle which the varying position of the magnetic needle makes with the geographical meridian; deviation from the true north (see TERRESTRIAL MAGNETISM).—SYN. of 'variable': mutable; wavering; unsteady; versatile;—of 'variableness': caprice; whim; humor; freak; fancy;—of 'variation': change; vicissitude; mutation; variety; deviation;—of 'variety': diversity; multifariousness; difference; sort; kind.

VA'SA, GUSTAVUS: see GUSTAVUS I.

VASARHELY, *vâ'shâr-hĕly'*, or HÓDME'ZÖ-VA'SARHELY, *hōd-mĕ'-zĕh-*: town of Hungary, on a marshy but fertile plain, 5 m. from the left bank of the Theiss, 16 m. n.e. of Szegedin, 90 m. s.e. of Budapest. It is the largest *market*-town of Hungary, and is handsomely built, with many elegant private residences.—The people mostly are Magyars, and mostly Protestants: they are engaged in cattle-breeding and in cultivation of the vine and tobacco.—Pop. (1870) 49,153; (1880) 74,094; (1900) 60,883.

VA'SARHELY, or MAROS-VA'SARHELY, *mŏr'ŏsh-*: see MAROS-VASARHELY.

VASARI, *vâ-zâ'rē*, GIORGIO: Italian architect, painter, famous as biographer and critic of artists: 1513–1574, June 27; b. Arezzo. He was a pupil of Michael Angelo, and obtained the patronage of many distinguished persons, as Cardinal Ippolito de' Medici, Clement VII., and the Dukes Alessandro and Cosmo de' Medici; but his pictures show the meretricious taste of his time, and possess no distinctive merit. His reputation rests on his *Vite de' più excellenti Pittori, Scultori, e Architetti* (Lives of the Most Excellent Painters, Sculptors, and Architects, Flor. 1

vols. 1550; 2d ed. by V. himself, 3 vols. 1568). This work is written, on the whole, in a simple and honest style, at times marked by a noble eloquence. The criticism is acute, candid, and usually admirable; and in spite of some inaccuracies (corrected by Della Valle, Rumohr, Förster, and others), it remains a model of art criticism and biography. V. died at Florence.—Bohn has pub. an Eng. transl. in 5 vols., forming part of the 'Standard Library' series.

VAS'CO DA GA'MA: see GAMA.

VASCULAR, a. *văs'kū-lĕr* [L. *vascŭlum*, a small vessel —from *vas*, a vessel: It. *vascolare;* F. *vasculaire*, vascular]: consisting of or containing vessels which convey fluids, as arteries or veins; composed of small vessels like the woody tissue or substance of flowering plants, used in contradistinction to *cellular*. VAS'CULAR'ITY, n. *-lăr'ĭ-tĭ*, state of being vascular, indicating in plants a higher degree of organization than simple *cellularity*. VAS'CULA'RES, n. plu. *-lā'rēz*, in De Candolle's system of botanical classification, the first of the two great divisions of plants, consisting of those furnished with Vascular Tissue (q.v.) as well as cellular tissue; and thus including all the phanerogamous plants, both endogenous and exogenous (see CELLULAR PLANTS). VAS'CULIF'EROUS, a. *-lĭf'ĕr-ŭs* [L. *fero*, I bear]: in *bot.*, having seed-vessels divided into cells. VAS'CULOSE, a. *-kū-lōs*, vascular. VASCULAR TISSUE, the woody tissue of plants formed of confluent cells; that kind of vegetable tissue which is composed of closed tubes or vessels, elongated cells. The tubes have membranous walls of Cellulose (q.v.), and within them are juices of the plant, which often deposit secretions. They are generally almost cylindrical—though sometimes prismatical from compression—but tapering to a point at each extremity, preserving their character as cells by being closed at the ends. They lie close together in bundles, and often overlie one another at the ends. The principal kinds of vascular tissue are Woody Fibre (q.v.) and Laticiferous Tissue, composed of the vessels which convey the Latex (q.v.). Laticiferous tissue is generally composed of branched and anastomosing tubes, whose walls are thin and delicate. Many varieties of vascular tissue have been distinguished by botanists. The most important is the *Fibro-vascular Tissue*, which has spiral fibres in the tubes, winding up the inside of their walls as if to strengthen them. These fibres are elastic, and the coil can often be easily unrolled, at least while the tubes are young. Many fibres are often found in a single tube. VASCULAR SYSTEM, in *anat.*, the system of blood-vessels; in *bot.*, that portion of the tissue of plants destined for the conveyance of air.

VASCULUM, n. *văs'kū-lŭm* [L. *vascŭlum*, a small vessel —from *vas*, a vessel]: in *bot.*, a pitcher-shaped leaf; an ascidium; a flattened cylindrical tin case for holding specimens while botanizing. VASCULIFORM, a. *văs-kū'lĭ-fawrm* [L. *forma*, shape]: having the form of a pitcher or vasculum.

VASE, n. *vās* or *vâz* [F. *vase*, a vessel—from L. *vasum* or *vas*, a vessel, a utensil: It. *vaso*]: an ornamental vessel, generally of an antique pattern; a large cup with handles; a sculptured vase-like ornament. VASE-SHAPED, a. shaped somewhat like a common flower-pot without the rim. VASIFORM, a. *vās'ĭ-fawrm* [L. *forma*, shape]: in *bot.*, applied to a vegetable tissue called dotted vessels, shaped like a blood-vessel.—*Vase* in its widest signification is a vessel of any kind, whether for use or ornament. When applied to ancient art, V. is generally used in this sense; but in connection with modern art it is restricted to ornamental vessels. Few remains of antiquity have excited more interest than vases, particularly those of Greece, and of the Greek colonies and conquests. The names given by classical writers to vessels adapted for different purposes have not always been easily identified with the ancient vases which have been preserved to us; but according to the nomenclature of Gerhard, which has generally been adopted, the following are the principal varieties, classified according to their uses: 1. Vases for holding wine, oil, or water, known under the names of *amphora* and *diota stamnos*. 2. Vases for carrying water, *hydria*, *calpis*. 3. Vases for mixing wine and water, *crater*, *kelebe*, *oxybaphon*. 4. Vases for pouring, *oinochoë*, *olpe*, *prochoüs*. 5. Drinking-cups or goblets, *cantharus*, *kyathus*, *karchesion*, *holchion*, *kyphos*, *kylix*, *lepaste*, *phiale*, *keras*, *rhyton*. 6. Vases for ointments or perfumes, *lekythos*, *alabastron*, *askos*, *bomylios*, *aryballos*, *kotyliscos*.

Vases of the precious metals were in use among the ancient Egyptians. Among the Greeks and Greek colonists of Asia Minor, they were employed at a very early date for sacrificial purposes. Those of silver were frequently chased. In the later period of the Roman republic, chased silver vases were in request; but under the empire, chasing fell into disuse. Bronze, iron, and lead were used as metallic materials for vases. Bronze vases abounded among the presents made to the Greek temples; they were generally thin and hammered out, often decorated with inlaid ornaments or reliefs, among which mythological subjects and animal heads appear; and the handle sometimes assumed the shape of the human figure. Leaden vases were used chiefly for unguents or perfumes. In the 12th c. a style was introduced, called *damascene* work, with patterns of gold or silver wire imbedded in iron or bronze: many vases of this kind were made by Benvenuto Cellini.

Among the minerals used for vases in ancient as well as in modern times, are marble, lapis lazuli, jasper; semi-transparent stones, such as opal, girasol, agate, chalcedony, sardonyx, cornelian; also transparent gems and rock-crystal. Great numbers of vases of precious stones were brought to Rome from the conquered provinces, particularly from Asia. Those in highest esteem were the *Myrrhine* (q.v.) vases, whose material has been the subject of dispute among antiquaries; they are described by Pliny as brilliant, gem-like, and of various colors, gener-

Chinese Vase Japanese Vase.

Egyptian Canopic Vase.

Egyptian Vases.

Assyrian Vases.

ally purple and white, mingled with the iridescent hues of the rainbow. Large and costly vases of malachite and jasper are manufactured in Russia; and elaborately carved vases are still made of the white alabaster of Volterra, in Tuscany.

Small toilet-phials of opaque glass were in use in Egypt as far back as B.C. 1450. The cameo vases of Rome, of which the Portland Vase (q.v.) is the most celebrated example, were composed of two layers of glass, the outer of which, being opaque, was cut down into groups of figures, delicately executed in relief. About the 3d c. appeared the *diatreta*, or bored vases, with an external veil of network, almost detached from the rest of the glass. In the 5th c. occur vases composed of two layers of glass, with gilded subjects—often figures of Christ and legends of saints—between them. Vases of green glass, of a later period, with undercut projections, bearing a rude resemblance to the diatreta, have been found in tombs in England and France. Venice afterward acquired great celebrity for its glass vases. In the beginning of the 16th c. the Venetian glass-makers introduced a class of vases enriched with white or colored filigree work, having the appearance of being incrusted in the glass: these were much sought after all over Europe; and great care was taken to keep the secret of their manufacture. Beautifully enamelled vases also were produced in the Venetian manufactories; as well as others of grotesque forms, representing imaginary animals, and pierced with holes or constructed in the form of a siphon, said to have been used by alchemists, and in pharmacy and distillation. German manufacturers in the 16th c. produced vases with heraldic designs and inscriptions in enamel, generally cylindrical, sometimes of considerable size, which are much prized by connoisseurs; in the 17th c. the designs became more artistic; and both in Germany and Italy it was usual for distinguished artists to be employed to decorate these glass vases, in imitation of rock-crystal, with ornaments, arabesques, and engraved subjects.

The most common material for vases of all kinds, including those intended to hold the ashes of the dead, has generally been baked clay.—For the terra-cotta vases of Greece, Italy, and other countries, see POTTERY.

VASELINE, n. *vás'ĕ-lĭn* [from Ger. *was*(ser), water, and Gr. *el*(aion), oil, and chem. terminative *-ine*]: an extract of petroleum or paraffin, used for medicinal and other purposes. It is a viscid semi-fluid substance, having nearly the consistency of soft soap; is yellowish, translucent, and crystalline in appearance, and is almost tasteless and inodorous. It is soluble in ether, and resists the action of most chemicals. V., used as a salve or liniment, is also made the base of various ointments and pomades; and may be taken inwardly as a remedy in colds, coughs, and hoarseness. It is an excellent lubricant; is serviceable for protecting polished steel or iron from rust; and has the advantage over animal and vegetable fats that it does not become rancid.

PLATE 2.

VASILKOV, *vâ-sĭl-kov'*: town of Little Russia, govt. of Kiev; 22 m. s.w. of the city of Kiev. V. was founded in the 10th c. It contains 10 factories, 5 of which are tobacco factories.—Pop. (1880) 16,597.

VASISHT'HA, *vâ-sĭsht'ha:* one of the most celebrated Vedic R'ishis (q.v.), author of several hymns of the R'igveda (see VEDA), and a person who seems to have had an important place in the early history of the Brâhmanic or priestly caste of the Hindus. He seems to have been a priest jealous of the privileges and the position of his caste, and ever ready to assert its superiority over the second or military and royal caste. In one of his R'igveda hymns he claims to have been enlightened by the god Varuna; and in another he is called the son of *Mitra* and *Varuna* (q.v.). In the Mahâbhârata (q.v.) he is mentioned as imparting divine knowledge to King Janaka, and as the family priest of the race of Ikshwâku; and in the Purân'as (q.v.) he is said to have been one of the arrangers of the Vedas in the Dwâpara age. In Manu and the Purân'as he becomes a patriarch, one of the nine mind-born sons of the god Brâhman. The most interesting episode of his life is his conflict with *Vis'wâmitra* (q.v.). Whether the V. mentioned as the author of a law-book is the same with the ancient sage, is doubtful.—See Muir's *Original Sanscrit Tests*, I. (1858).

VASODENTINE, n. *văs'ō-dĕn'tĭn* [L. *vasum*, a vessel; *dens* or *dentem*, a tooth]: in *anat.*, that modification of dentine in which capillary tubes of the primitive vascular pulp remain uncalcified and carry blood into the substance of the tissue.

VASSAL, n. *văs'săl* [F. *vassal*, a vassal—from W. *gwas*, a young man, a servant (see also VALET)]: during the *feudal system*, any one dependent on a superior lord; any one holding land from a superior; a feudatory tenant; a servant; a bondsman: ADJ. subject; subordinate. VAS'SALAGE, n. *-āj*, state of being a vassal or feudatory; political servitude or dependence territory held in vassalage; a fee or fief. VAS'SALRY, n. *-rĭ*, the body of vassals.

VASSAR, *văs'ér*, MATTHEW: philanthropist: 1792, Apr. 29—1868, June 23; b. Tuddenham, England. He came with his parents to America 1797, settling near Poughkeepsie, N. Y. His father, James V., commenced a brewing business in Poughkeepsie 1801, which became the foundation of the son's great wealth. V. transferred to a board of trustees 1861, Jan., $408,000 to found a college for women: the site also, 200 acres, near Poughkeepsie, was a gift from V.; by his last will he left to the college $150,000 to be applied to various purposes.

VAS'SAR COLLEGE: school of the liberal arts for women, near Poughkeepsie, N. Y. Originally it was named Vassar Female College, but since 1867 it has been styled V. C. In a memorandum accompanying the deed of gift to the college trustees of $408,000 and the site, the founder (see VASSAR, MATTHEW) declared his purpose to found not a charitable institution, but a school in which women

might obtain a thorough liberal education at moderate cost: the college was not to be under sectarian control; nevertheless, the training of the pupils was never to be 'intrusted to the skeptical, the irreligious, or the immoral. The institution was incorporated 1861. About half of the founder's money-gift was devoted to the construction of the buildings, which consist of a main building 5 stories high, 500 ft. long, 200 ft. wide at the centre and 164 ft. in the transverse wings. Besides the main building, which contains the students' quarters, class-rooms, library, reading-room, professors' lodgings, etc., there are various laboratories, an astronomical observatory, museum, gymnasium, etc. The college was formally opened 1865, Sep., with 8 professors and 20 instructors; before the close of that year there were 350 students. The first pres., Milo P. Jewett, held office from the incorporation of the institution till 1864; he was succeeded by John H. Raymond, LL.D., to whom succeeded the Rev. J. R. Kendrick, D.D., till 1885; the Rev. James M. Taylor, D.D., became pres. 1886. The number of professors and instructors (1894–5) was 46, of whom 34 were women; students in college course 484. The college course occupies 4 years. There were 18 scholarships and 1 fellowship. The vols. in library numbered 22,000. The value of scientific apparatus and library was $156,938; of buildings and grounds $715,015. In 1901 there were 72 prof. and instruc.; 798 stud.; vols in lib. 35,000; productive funds $972,026; val. grounds and buildings $1,113,865; income $332,069. Tuition fees are $100 per year, board and lodging $300. The dept. of natural science comprises classes in chemistry, physics, botany, mineralogy; there are also classes in the history of art and in political economy. The courses in the school of liberal arts are equivalent to those of colleges for men, and comprise the Greek and Latin languages, mathematics, astronomy, rhetoric, English philology, German, French, mental and moral philosophy. At the end of the 25th year of the existence of V. C., 1890, an important change in its govt. was introduced: by vote of the faculty, the Students' Association was invited to assume the care of maintaining the laws and discipline of the institution. The schools of music and of fine art (which are empowered to confer degrees in those branches) are distinct from the regular college course: attendance in these schools involves extra fees.

VAST, a. *vâst* [F. *vaste*, vast—from L. *vastus*, desolate, immense: It. *vasto:* see also *waste*, from the same root]: of great extent; very great in bulk, amount, numbers, force, or importance; very spacious; immense; in *OE.*, void; waste: N. that which is immeasurable; space. VAST'LY, ad. *-lĭ.* VAST'NESS, n. *-nĕs*, immense bulk or extent; immensity: greatness. VAST'Y, a. immense; mighty; enormously great. VASTIDITY, n. *văs-tĭd'ĭ-tĭ*, in *OE.*, immensity.—SYN. of 'vast': huge; enormous; prodigious; mighty.

VASTO, *vâs'to,* or IL VASTO, *ēl vâs'to:* town on the e. coast of s. Italy, province of Chieti; 26 m. s.e. of Ortona. It is on rising ground facing the Adriatic, 1½ m. distant; is inclosed by walls, and contains a spacious square with handsome fountain, a fine palace, a castle, and several churches. It has active trade in corn, oil, and vinegar. —Pop. 9,761—commune 13,883.

VASUDE'VA AND VASUDE'VA: see VISHN'U.

VAT, n. *văt* [AS. *fæt;* Dut. *vat;* Dan. *fad;* Icel. *fat;* Ger. *fass,* a tub, a vessel for holding liquids]: a large vessel or cask for holding liquids, particularly fermented liquors, in an immature state; a large vessel or cistern for steeping hides in: V. to put or pour into a vat. VAT'TING, imp. VAT'TED, pp.

VATE'RIA: genus of plants to which the tallow-tree belongs: see TALLOW-TREE.

VATIC, a. *văt'ĭk* [L. *vatēs,* a bard or prophet]: affected by supernatural influence; prophetic.

VATICAN, n. *văt'ĭ-kăn* [L. *mons vatĭcānus,* the Vatican Hill, in Rome, on the western bank of the Tiber]: the assemblage of buildings, adjoining the Church of St. Peter in Rome, which forms the pope's palace; hence, the papal authority or government. VATICANISM, n. *văt'ĭ-kăn-ĭzm,* the papal system of rule and religious obligations; the theological and ecclesiastical system based on the doctrine of papal infallibility and absolute papal supremacy; ultramontanism. VAT'ICANIST, n. *-ĭst,* an ultramontanist. THUNDERS OF THE VATICAN, the anathemas or denunciations of the pope.

VAT'ICAN, COUNCIL OF THE: assembly of the bishops of the Rom. Cath. Chh., in the Vatican Palace, Rome, 1869, Dec. 8. The papal bull of Pius IX. convoking the V. C. was issued 1869, June 29; but the previous Sep. the pope had invited to attend 'all bps. of the churches of oriental rite not in communion with the apostolic see,' and all 'Protestants and non-Catholics;' but neither the separated orientals nor the Protestants were to have any voice whatever in the council; and in a letter to Card. Manning the pope wrote that the Protestants were invited to attend only that they might be referred to 'experienced men' for solution of their difficulties. Naturally, no bp. of any separated oriental chh. nor any Protestant responded to the invitation. Pius IX. had for many years meditated the calling of the council, and had sounded his bps. throughout the world to learn how they were disposed toward the convocation of a general council. Early in 1865 preliminary work toward preparing the subject-matters of the council was begun, and a 'congregation of direction' was named from the College of Cardinals; theologians were chosen from different countries as consulters to the preliminary congregations: all this in the strictest confidence. All the bps. of the chh. were formally invited 1867, June 4, to be present in Rome at the centenary of the martyrdom of Peter and Paul: those who attended were asked to give suggestions on sundry points of discipline and other mat-

ters later to come before the council. In addition to the 'congregation of general direction,' 6 special congregations were instituted 1869, June—viz., for 'ceremonial,' 'chh. and state,' 'oriental churches,' 'religious orders,' 'dogmatic theology,' 'discipline:' the members were ecclesiastics from all parts of the world, with cardinals as chairmen. That the question of papal infallibility was to come before the council, there was no authoritative announcement, public or private, till the council met; but 1869, Feb. 6, in the semi-official *Civiltà Cattolica*, a correspondent declared that the council would declare the pope infallible. The German bps., in council at Fulda 1869, Sep., took alarm at this announcement, and expressed their fears of consequences should papal infallibility be made an article of faith. The 'order of business' of the council was promulgated 1869, Nov. 27; commissions were at the same time named to discuss suggestions offered by bps.; drafts (*schemata*) were prepared of the decrees proposed to be adopted by the council. When the council opened, 719 members were present; the largest number present at any session was 764, all bps., abps., patriarchs, etc., except 52 who were abbots, generals of orders, etc. But of the bps. 120 were of titles *in partibus infidelium*. There was in the council some discussion of matters of discipline, but that had no definitive outcome. The real occupation of the council was with matters—or rather with a matter—of dogma; the whole completed result is found in the two 'constitutions,' as they are called—one, *De Fide Catholica*, an exposition of points of faith that no one in the chh., whether in the council or out of it, ever questioned; the other, *De Ecclesia Christi;* in this is embodied the definition of the pope's infallibility. The first constitution was adopted without delay and unanimously by 667 voices. The second was a subject of impassioned discussion till the very last day of the sittings. In 1870, Jan., 45 German and Austrian bps., 32 French, 3 Portuguese, 4 oriental, 7 Italian, 27 Anglic (i.e., from English-speaking countries), begged the pope to have the dogma withdrawn; the protest was strongly supported from outside by the govts. of France, Austria, Bavaria, Portugal, Prussia; and many very distinguished members of the council—e.g., Manning (Westminster), Spalding (Baltimore), Strossmayer of Slavonia, Rauscher (Vienna), Darboy (Paris), Dupanloup (Orleans), Kenrick (St. Louis), besides signing the petition, took an active part in organizing the opposition. When the constitution as it stands was read in council (July 13), 451 members voted *placet* (i.e., yea), 62 *placet juxta modum* (yea, provided certain changes were made in phraseology); 88 *non placet* (i.e., nay); 70 abstained from voting. July 18 the constitution came up for a final vote, and there were 535 yeas, a gain of 84 on the vote of 5 days before: this gain, no doubt, came mainly from the middle faction, who had then voted *placet secundum modum*, and in part from the absent or non-voting 70. The opposition (*non-placet* faction) was nowhere visible at the close of the battle. Of the 88 who formed its voting strength July 13,

only 2 stood in their place July 18. These were Edward Fitzgerald, Bp. of Little Rock, Ark. (b. Limerick, Ireland, 1834), and Riccio, Bp. of Ajaccio. The council was prorogued Sep. 20.

VAT'ICAN, PALACE OF THE: residence of the pope in Rome, and seat of the great library, museums, and art-collections, ancient and modern, which, for visitors, constitute one of the chief attractions of that city. The popes, very soon after the establishment of the peace of the church under Emperor Constantine, had a residence at the V., which they occupied jointly with that of the Lateran. After the mediæval period, Nicholas V. began that systematic scheme for improvement and embellishment of the V. which has resulted in what, taken altogether, may be regarded as the noblest of princely residences. Alexander VI., Julius II., and, above all, Leo X., pursued the same plan; and there are very few of the succeeding popes who have not had a share in the enlargement or embellishment of the Vatican. Amid all the difficulties, financial and political, of his pontificate, Pius IX. carried out many tasteful works of completion or restoration, the most striking and effective of which is the great stair by which it is approached from the colonnade of St. Peter's. The building, with its gardens and other appurtenances, is said to cover a space equal to the whole area of the city of Turin, as it was about 1747, with a pop. of 130,000. It is popularly believed to contain 16,000 apartments of various sizes, but this is probably an exaggeration. Some of the rooms are of unrivalled beauty—e.g., the Chapel of San Lorenzo, the Pauline Chapel, and the still more celebrated Sixtine Chapel, decorated in frescoes from the pencil of Michael Angelo; the Sala Regia, the galleries and halls decorated by Raphael, Giulio Romano, and their scholars; the magnificent library, which, though surpassed in the number of vols., is unrivalled in Europe in extent, in beauty of proportions, and in decorations; the galleries of antiquities, Christian and pagan, and of paintings, statuary, bronzes, medals, vases, and other objects of art. The library was opened for historical research by Leo XIII. 1883, under certain conditions—an immense gain to the study of history. Many descriptions of the V., with costly illustrations, have been published.—See Donovan's *Rome, Ancient and Modern;* see also Hare's *Walks in Rome*, and, for recent additions and changes, Murray's *Handbook of Rome.*

VAT ICAN CO'DEX: manuscript copy of the Septuagint version of the Old Test. and of the greater part of the New, in the original Greek; it is written in uncial characters, and is possibly the most ancient, certainly one of the two most ancient MSS. extant of the Bible, dating probably from the 4th c. (see SINAITIC CODEX); it is called V. C. from the fact that it is preserved in the Vatican library at Rome, its designation among biblical critics and scholars is 'B,' 'A' being the *Codex Alexandrinus* (see ALEXANDRIAN CODEX). In its original state the handwriting must have been a model of elegant penmanship; but nearly the whole of it has been traced over at a later time (10th or

11th c.). The letters throughout are of uniform height and style, and there are no large initial letters: see PALEOGRAPHY. The writing is in 3 columns of 42 lines each, and covers 759 leaves of very fine vellum. The contents are: the whole LXX. Old Test. (with a few gaps) less the two books of Maccabees; and the New Test. as far as Heb. ix. 14.—The history of this MS. prior to its being brought to the Vatican library—perhaps early in the 15th c.—is unknown.

VATICIDE, n. *văt'ĭ-sīd* [L. *vatēs*, a prophet; *cædĕrĕ*, to kill]: the murder or murderer of a prophet. VATICINAL, a. *vă-tĭs'ĭ-năl* [L. *vaticĭnor*, I prophesy—from *vatēs*]: pertaining to or containing prophecy; prophetic; inspired. VATIC'INATE, v. *-nāt*, to prophesy. VATIC'INA'TION, n. *nā'shŭn*, prophecy. VATIC'INATOR, n. *-nā-tĕr*, a prophet.

VATTEL, *vât-tĕl'*, EMERICH DE: writer on international law: 1714, Aug. 25—1767, Dec. 20; b. Couvet, in Neufchâtel; son of a Prot. clergyman who had been ennobled by the king of Prussia, whose subject he was. V. studied for the ministry at Bâle and Geneva, but he gave more attention to the writings of Leibnitz and Wolf than to those of the Calvinistic divines; and instead of becoming a country clergyman, he resolved to push his fortune at the court of Berlin, as a man of letters and diplomatist. In 1744 he received an appointment at Dresden from the Elector of Saxony, then also king of Poland; and 1746 he was sent by him as minister to Bern. In this post he had ample leisure for literary pursuits. He published, in French, under different titles, collections of essays on miscellaneous subjects; but his chief attention for ten years was bestowed on his great work, the *Droit des Gens; ou Principes de la Loi Naturelle appliqués à la Conduite et aux Affaires des Nations et des Souverains.* This work contained little that was new, but it abridged and systematized the doctrines of Grotius, Puffendorf, and Wolf. V. had that skill in arranging his materials, and that power of lucid expression, which so often characterize French men of letters; and his book became rapidly popular as a textbook of international law. Like all his predecessors in the same field, V. based his whole system on an imaginary law of nature, and it would be easy to enumerate a large number of false conclusions to which he came in the absence of the light thrown on the law of nations by practice, and by the principle of utility in our time, so generally adopted as the test of international morality. After the completion of his great work, V. was recalled to Dresden, where he married, 1764, and was promoted to the rank of privy councilor. An Eng. transl. of Vattel, with notes, was repub. by Chitty 1833.

VAUBAN, *vō-bŏng'*, SEBASTIEN LE PRESTRE DE, Marshal of France: renowned military engineer: 1633, May 15—1707, Mar. 30; b. at Saint Leger de Fougeret, dept. of Nièvre. He was left an almost destitute orphan at the age of ten, and his education was under the auspices of the *curé* of his village. Leaving Saint Leger 1651, he set out

on foot to join Condé's army on the Belgian frontier. Taken prisoner 1653, he joined the royalists, and during the succeeding contest was attached mostly to the army of Turenne, in which his engineering work gained him high repute. In 1667 he appeared again in the north, capturing one after another the strong defenses of the Belgian frontier. About this period, V.'s probity and punctuality, no less than his genius, charmed the powerful Louvois, who appointed him to the honorable work of fortifying the Flemish strongholds which had fallen into the possession of France. In the war with Holland, V. took his old place as director of siege operations, and introduced into practice in w. Europe the method of approach by parallels (recently borrowed from the Turks), at the siege of Maestricht (1673); and with such effect that that strong fortress capitulated in 13 days. In 1676 he conducted the remarkable sieges of Valenciennes and Cambrai; stormed the latter in open day, against the unanimous opinion of the generals of the army; and two years later was rewarded for his long and glorious services by the appointment of director-gen. of fortifications, with supreme control of the dept. of milit. engineering. V. surrounded France with a cordon of fortresses; he also captured the almost impregnable fortress of Luxembourg, and planned the magnificent aqueduct of Maintenon, conveying the waters of the Eure to Versailles.

In the war which broke out 1688, V. conducted the sieges of Philipsburg, Mannheim, and Frankenthal (introducing, at the last, his invention of ricochet-firing), Mons (1691), and Namur (1692), with his usual success. After this period, V. produced few professional works of importance. After the peace of Ryswick 1697, he applied his practical mind to the various deficiencies and anomalies in the internal government of France; and one of his works, *Dîme Royale* (1707), excited an immense sensation by his discussion of taxation, in which he anticipated the doctrines which, a century later, overthrew the French monarchy. V. lost favor with the king, and his book was seized and confiscated. He died at Paris.—Fontenelle calculates that V. had constructed 33 new fortresses, repaired 300 old ones, conducted 53 sieges, and had been present at 140 'actions of vigor;' and in his practice the capture of a fortress was certainly a mere question of time and powder.—See his professional works, *Œuvres Militaires* (Paris 1796). See *Nouvelle Biographie Générale.*

VAUCLUSE, *vō-klüz';* department in s.e. France, bounded w. by the Rhone, s. by the Durance, which separates it from the dept. of Bouches-du-Rhone; 1,273 sq. m. The Rhone is the great river, and its affluents, except the Durance, are small. The dept. is traversed in the e. by spurs of the Alps. The plains are in the w.—the chief being those of Orange, Carpentras, and Cavaillon. In the e., the mountains are separated by narrow, torrent-plowed valleys; and the summits, the chief of which is Mont Ventoux, 6,273 ft. high, are arid and bare. The climate is healthful and temperate, though subject to great varia-

tions—the winds from the n. and n.e. being sometimes violent. V., though more agricultural than manufacturing, does not produce cereals largely; but the peach, pear, prune, almond, and fig trees thrive; and olive, mulberry, and orange trees abound. Wines and honey of fine quality are produced. There are four arrondissements—Avignon, Apt, Carpentras, and Orange. Avignon is the cap.—Pop. of dept. (1881) 244,149; (1886) 241,787; (1901) 236,949.

VAUD, *vō* (Ger. *Waadt*): canton in w. Switzerland, between the Jura and the Bernese Alps; 1,244 sq. m. V. is the third in pop. among Swiss cantons. It is comparatively level, but is traversed by an elevated tract, known as Mt. Jorat, from which plains slope to the Lake of Geneva on the s., and the Lake of Neufchâtel on the n. On both sides, near the mountains, are extensive pasture-lands, but the greater part of the country is highly cultivated. The orchards and vineyards are very extensive, the latter yielding excellent white wines. There are no manufactures of importance. V. is traversed by railways, which connect it in two directions with France, and in three, with the rest of Switzerland. It forms part of French Switzerland, the dialect spoken being the Vaudois. The religion is Prot. Since 1830 V. has been a democratic republic, the council of the canton being elected and controlled by the people. After the fall of the Roman empire, V. formed part of the Burgundian kingdom. In the 13th c. it became a dependency of Savoy, to which it was annexed 1359. In 1476 the House of Savoy took part with the Duke of Burgundy in his struggle with the Swiss; and on his defeat a part of V. was annexed to the adjoining cantons. In 1536 the Bernese took possession of the whole of V., which they divided into 15 parts, administered by *baillis*, appointed at Bern. The nobility became patricians of Bern, and thus acquired great influence. Still, the local councils had the power of appointing magistrates and administrative officers, which tempered the aristocratic character of the government. The French invasion put an end to the rule of Bern, and V. became a separate canton. The government remained in the hands of the higher classes until 1830, June, when a new constitution, granting a vote to every adult *bourgeois* of good character, was obtained from the council. The existing democratic-representative constitution dates from 1845, but was revised 1861. The Vaudois are industrious and well educated. Cap. Lausanne (q.v.).—Pop. of V. (1879) 231,700; (1880) 238,730; (1900) 281,379.

VAUDEVILLE, n. *vōd'vĭl* [F.—a corruption of the name *Vaux-de-Vire*, in Normandy, where lived about the middle of the 15th c. Olivier Basselin, a satirical poet, whose drinking-songs, known as *Les Vaux-de-vire*, became popular throughout France]: lively song, sung in couplets, with a refrain; a theatrical piece intermingled with light or satirical songs; also spelled VAUDEVIL, n.

VAUDOIS, n. *vō-dwá'*: an inhabitant or the inhabitants of the Swiss canton of Vaud (q.v.); dialect spoken in the canton Vaud: ADJ. of or belonging to the canton Vaud, its people or their dialect; Waldensian. see also WALDENSES.

VAUGHAN, *vaw'an*, nearly *vawn*, BENJAMIN, LL.D.: political economist: 1751, Apr. 19—1835, Dec. 8; b. Jamaica, W. Ind.; son of Samuel V., London merchant, whose wife was a native of Boston, Mass. V. was educated at Cambridge Univ., England; graduated in medicine at Edinburgh 1781; soon afterward became a merchant in London. He was the intimate friend of Benjamin Franklin, and conducted an active correspondence with him and other philosophers and publicists of the time—e.g., Jeremy Bentham, Sir Samuel Romilly, Grey, Wilberforce. He edited the first collection of Franklin's fugitive writings. V. wrote much himself on economic questions, but anonymously. He settled in Hallowell, Me., about 1800; and there passed the remainder of his life, practicing his profession among the poor, and giving medical counsel and medicines to his patients gratis. A large part of his fine library he gave to Bowdoin College.

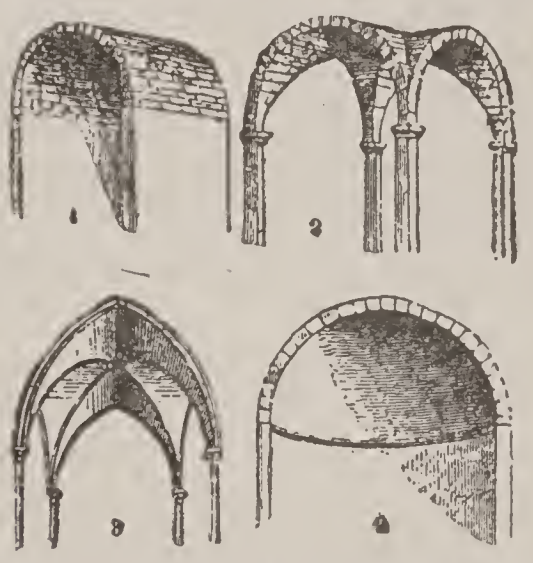
VAUGHAN, CHARLES JOHN, D.D.: clergyman of the English Church: b. England, 1816. He graduated at Cambridge 1838; was elected fellow of Trinity Coll. 1839; was head-master of Harrow School 1844-59; vicar of Doncaster 1860-69; master of the Temple, London, 1869-79; dean of Llandaff 1879. Dr. V. was one of the leaders in the 'broad church' movement, and held high rank as a preacher. He pub. several vols. of *Sermons* and commentaries. He died 1897, Oct. 15.

VAUGHAN, HERBERT, D.D.: cardinal-abp. of the Rom Cath. Church: b. Gloucester, England, 1832, Apr. 15. He was educated at the Jesuit Coll., Stonyhurst, Lancashire, and in Rome. After ordination he founded St. Joseph's Missionary College at Mill Hill, Middlesex, an institution designed to prepare missioners for work among the black race, particularly in the United States. He accompanied to the United States the first band of missioners, and founded a college in Md. 1871. He was consecrated bp. of Salford, England, 1872. He succeeded Cardinal Manning as abp. of Westminster 1892, the appointment being published by the Congregation of Cardinals Mar. 29. V. is proprietor of the London *Tablet* (weekly journal) and of the *Dublin Review* (quarterly in London). Dr. V. was made a cardinal, 1893, Jan. 16. He died 1903, June 19.

VAUGHAN, ROBERT, D.D.: British Congl. minister and writer: 1795-1868; b. Wales. He was educated at Bristol Coll.; then was a Congl. pastor in Worcester, and afterward in Kensington; prof. of ancient and modern history in London Univ. 1830-42; pres. of the Independent College, Manchester, 1842-57, retiring from that post on account of ill health. Thereafter he was minister at Uxbridge for a short time. V. was founder of the *British Quarterly Review*, 1844, and its editor till 1867. He pub. a Life of Wycliffe (1828); *Protectorate of Oliver Cromwell* (1838); *History of England under the Stuarts* (1840); *Protestant Nonconformity* (1843); etc.

VAULT, v. *vawlt* [F. *volte*, a round, a turn: It. *volta*, a turn, a tumble: from same root as VAULT 2]: to bound or curvet as a horse; to turn or make a turn; to leap or leap over with the help of a pole or of something to lay the hands on; to bound: N. the bounidng-turn which skilful riders teach their horses; a leap; a tumbler's gambol or turn. VAULT'ING, imp. VAULT'ED, pp. VAULT'ER, n. *-ĕr*, one who vaults or leaps; a tumbler.

VAULT, n. *vawlt* [OF. *voute*, *voute*, a vault, cavern—from L. *volūtus*, pp. of *volvĕrĕ*, to roll or turn about: F. *voûte;* It. *volta*, a vault, an arched roof]: an arched roof of stone or brick-work; cellar or underground building having an arched roof; cave or cavern: underground repository or closely constructed building for the dead: arch-like expanse, as the *vault* of heaven: V. to shape as a vault; to arch. VAULT'ED, a. having a concave overhead; covered with vaults or arches. VAULTY, a. *vawlt'ĭ*, in *OE.*, arched; concave. VAULT'AGE, n. *-ăj*, in *OE.*, a vaulted room. VAULT'ING, n. *-ĭng*, a range of vaults.—*Vaults* are of various kinds. The simplest is the plain wagon or



1, Cylindrical, barrel, or wagon vault; 2, Roman vault, formed by the intersection of two equal cylinders; 3, Gothic groined vault; 4, Spherical or domical vault.

tunnel vault, being a simple segmental or semicircular arch, thrown across a longitudinal apartment, and extending from one end to the other: ordinary bridges are an example of this style of vaulting. Such vaults were commonly used by the Romans, who built also vaults with *groins*—i.e., vaults intersecting one another: see GROIN. A pointed variety of the tunnel arch was used by the Assyrians for vaulting their large drains. The Egyptians are said to have been acquainted with vaulting; but the earliest remains of ancient vaults of any magnitude are Roman works.

The Roman vaults, where groined, are usually constructed with carefully cut stone, to prevent the angle from chipping. Mediæval architects formed the groins only of dressed stone, and the filling in of the vault with commoner materials. This led to the groin becoming a prominent feature in mediæval architecture, being gener

ally ornamented with moldings and carved work. Dome-shaped or hemispherical vaults also were much used by the Romans. The Pantheon in Rome is the finest extant example, being a circular building with a dome 142 ft. in diameter. Roman domes and vaults are frequently ornamented with sunk panels. During the Renaissance period, vaulting in great measure gave place to wooden roofs; but when employed, the domical or plain groined vaults of Roman architecture are chiefly used. See GOTHIC ARCHITECTURE: FAN-TRACERY VAULTING: RIB: ETC.

VAULT'ING SHAFT: small column or pillar supporting the ribs of a Gothic vault. These shafts generally occur in clusters, and may either spring from the ground, or be supported on small corbels in the wall.

VAUNT, v. *vânt* [F. *vanter;* It. *vantare,* to vaunt, to brag—from mid. L. *vanitārĕ,* to boast—from L. *vānus,* vain, empty]: to make a vain display of: to boast; to play the braggart: N. a boast; a brag; a vain display. VAUNT'ING, imp.: N. conceited or vainglorious boasting. VAUNT'ED, pp. VAUNT'ER, n. *-ér,* a boaster; a braggart. VAUNT'INGLY, ad. *-lĭ.*

VAUNT, n. *vânt* [F. *avant,* before]: in *OE.,* the van; that which precedes; the beginning or first part. VAUNT COURIER, in *OE.,* a van-courier; a forerunner; a precursor.

VAUQUELIN, *vō-klăng',* JEAN: French poet: 1535–1607; b. at the château of La Fresnaye, near Falaise; of noble family. He made a pretense of studying law at Poitiers, at Paris, and at Bourges, but really spent his time in gayety and verse-making. He finally became pres. of the *Présideal* bench at Caen, where he died. His *Œuvres Poétiques* contain many sportive songs and other light pieces. He was the first writer of idyls in French verse, and is considered the founder of French satire, which he redeemed from its previous grossness.

VAUQUELINITE, n. *vawk'lĭ-nīt* [after *Vauquelin,* a French analytic chemist (1763–1829)]: a chromate of lead and copper, occurring in veins with other ores, of a dark olive-green color and resinous lustre.

VAUX, *vawks,* CALVERT: landscape architect: b. London, England, 1824, Dec. 20. He was educated in the Merchant Taylors' School, and studied architecture. Coming to the United States 1848, his first work was in the laying out of the grounds of the Capitol and the Smithsonian Institution at Washington. With Frederick Law Olmsted, he drew the plans of the Central Park, New York, and superintended their execution. He designed Prospect Park, Brooklyn. Afterward, in conjunction with Olmsted, he designed parks for Chicago, Buffalo, and Niagara Falls, and Riverside and Morningside parks, New York. He designed also many notable private residences, and the Belvedere in the Central Park, New York. He published *Villas and Cottages.* He d. 1895, Nov. 19.

VAUXHALL, *vawks-hawl'.* famous public garden in Lambeth, London, dating from 1660. It was situated near the manor called Fulke's Hall (residence of Fulke

de Breauté, follower of King John)—hence its name. Pepys, writing 1667, May 28, describes the garden, and concludes that the entertainments there to be had are 'mighty devertising.' On the whole, however, V. does not appear to have been particularly strict in its morals. The loose character of its amusements is freely sketched by the dramatists and novelists of the 18th c., and is revived in Thackeray's *Vanity Fair*.

VAUXHALL' NEC'TAR: mixture of rum and syrup, with an addition of benzoic acid, or flowers of Benjamin.

VAVASOR, n. *văv'a-sŏr*, or VAV'ASOUR, n. *-sŏr* [OF. *vavasseur;* mid. L. *vavassor*, a vavasor; *vassus*, a retainer (see VASSAL)]: under the *feudal system*, one who, himself holding of a superior or lord, had others holding under him; one who held his lands from one of the higher nobility, and not directly from the crown. In this class were comprehended the *châtelains*, who owned castles or fortified houses, and possessed rights of territorial justice. VAV'ASORY, n. *-sŏr-ĭ*, the lands of a vavasor.

VAWARD, n. *vä'waword* [corrupted from *vanward* = *vanguard*]: in *OE.*, the advanced-guard of an army; the vanguard; the first of anything.

VAYGACH, *vī-gäch'* (also *Vaigatch*, *Vaigatz*, and *Waigatz*): island of the Arctic Ocean, belonging to Russia; between the mainland and the island of Nova Zembla. The strait which separates V. from the mainland is about 5 m. wide. There is no resident pop.; but, being productive in furs and fish, it annually attracts Russian and Samoyede hunters.

VÂYU, *vâ'yô* [from Skr. *vâ*, blow]: in the Vedic mythology of the Hindus, the wind, or the god of the wind. According to Yâska (q.v.), ancient commentators of the Vedas hold that there are only three great deities—viz., *Agni*, fire, whose place is on earth; *Sûrya*, the sun, whose place is in heaven; and *Vâyu*, or *Indra* (q.v.), whose place is in the intermediate sphere. In the epic and Purânic mythology, V. occupies an inferior position, and the legends there related of him have no cosmical character. They give him a wife, *Anjanâ*, by whom he has a son, the monkey *Hanumat* (q.v.). When represented, V. either rides on an antelope, with a sabre in his hand, or he is seated, holding his son Hanumat in his arms.—See Muir's *Contributions to a Knowledge of the Vedic Theogony and Mythology*, in *Journal of the Royal Asiatic Society*, 1864.

VÂYU-PURÂN'A: see PURÂN'A.

VEAL, n. *vēl* [OF. *veel;* F. *veau*, veal—from L. *vitellus*, a little calf; *vitŭlus*, a calf]: the flesh of a calf.

VECTOR, n. *vĕk'tŏr* [L. *vector*, a bearer—from *vectus*, pp. of *vehĕrĕ*, to carry]: a line supposed to be drawn from a body moving round any centre to that centre; a straight line connecting any point, as of a curve, with a fixed point or pole round which it turns: see RADIUS VECTOR, under RADIUS, which is the common name.

VEDA, n. *vē'dá* [Skr. *veda*, knowledge—from *vid*, to know]: one of four collections of ancient writings in Sanskrit, forming the basis of the Brahmanical system of religious belief (see INDIA—*Religion*). VEDIC, a. *vē'dĭk*, of or pertaining to the Vedas and their literature.—The oldest *Veda*—and probably the oldest literary document existing—is the *R'igveda;* next earliest of Vedas is the *Yajurveda* and *Sâmaveda;* latest is the *Atharvaveda.* The first three also bear the collective title *trayî*, or 'the threefold' (sc., science); and all four are considered divinely inspired. Each of these Vedas consists of two distinct divisions—a *Sanhitâ*, or collection of *mantras* or hymns; and a portion called *Brâhman'a.* The mantras are prayers, praises, thanksgivings, meditations, lamentations, blessings, imprecations, etc. (See Müller, *Anc. Skr. Literature*, 343.) If a *mantra* is metrical, and intended for loud recitation, it is called *R'ich* (from *r'ich*, praise)—whence the name *R'igveda*—i.e., the Veda containing such praises: if it is in prose, and intended for inaudible muttering, it is called *Yajus* (from *yaj.* sacrifice); therefore *Yajurveda* signifies the Veda containing such *yajus:* if it is metrical, and intended for chanting, it is termed *Sâman;* whence *Sâmaveda* means the Veda containing such *sâmans.*—No special name is given to the mantras of the fourth Veda. The author of the mantra—the inspired 'seer'—is termed its *R'ishi* (q.v.); and the object in which the mantra is concerned is its *devatâ*—a word which generally signifies 'deity,' but whose meaning in connection with the mantras is various. *Brâhman'a* designates, according to *Mâdhava-Sâyan'a*, the great commentator on the Vedas, that portion in prose of the Vedas which contains either commandments or explanations, and sometimes mystical and philosophical speculations: the *Brâhman'a* portion of the Vedas is therefore the basis on which the Vedic ritual rests (see KALPA: VEDÂNGA), and whence the *Upanishads* (q.v.) and the philosophical doctrines (see SANSKRIT LITERATURE) took their development.

Though *Mantras* and *Brâhman'as*—both of which are termed also *S'ruti* (q.v.)—were held at a later period of Hinduism to have existed simultaneously—that is, from eternity—it is certain that the Brâhman'a portion of each Veda is posterior to at least some part of its Sanhitâ, for it refers to it; and so great a bulk of works as that represented by both portions must have been the gradual result of a considerable period of time, reflecting various conditions of society, various phases of religious belief, and different periods of language. The difficulty, however, critically to discern these periods, is enhanced by the losses which these writings suffered before they were preserved in the shape in which we now possess them. Both Mantras and Brâhman'as had to pass through a large number of S'âkhâs, or schools, and these schools were in animosity to one another—each S'âkhâ claiming to possess the only true and genuine Veda. These S'âkhâs were very numerous; though the R'igveda is now extant in only one, the Sâmaveda in perhaps two, etc. (See Müller's

Anc. Skr. Lit., 51.) The result was an endless variety in readings of the S'ruti, in arrangement of the writings, in additions and omissions of texts, and in *interpretation* of passages.

The character of the Sanhitâ or Mantra portion of the four Vedas—on which their Brâhman'a portion is based—as well as the relation in which these Sanhitâs stand to each other, is intelligible only if it is borne in mind that the ancient Hindu believed that he could secure the favors of his gods chiefly by sacrificial rites; that gradually these rites became complicated and manifold, and that special care, therefore, had to be taken to provide for a correct celebration of the sacrifices. The original worship seems to have been simple (see INDIA—*Religion*); but when sacrifices were instituted which lasted from one day to eleven, or even to a hundred days, or for several years, and when the Brahmanic caste found in such sacrifices the means of establishing its sway over the other castes, and of an easy livelihood, it was made a rule that no sacrifice could be performed without one *R'itwij*, or priest; and that a great sacrifice celebrated by wealthy people required the assistance of not less than 16 priests, besides menials, chanters, etc. It was requisite that the Brahman priest, most learned in the Vedas of all the priests, should supervise all details in the complicated and artificial ritual. (See Müller, *Anc. Skr. Lit.*, pp. 468, 469.)

The R igveda being the earliest of the Vedas was therefore less developed in ritual form and for sacrificial use than were the later; hence a tendency arose to maintain the greater practical efficiency of one of the later Vedas over the avowedly oldest Veda. For though some hymns in the R'igveda bear testimony to the existence, at that early period, of ritual acts, it does not follow that the R'igveda, as such, was composed for recitation during their performance. A collection of songs, in short, which was the growth of time, and, to some extent, a natural expression of feeling, became inadequate for a regular liturgy of a highly developed ritual. Out of this necessity there arose the *Sâmaveda* and the *Yajurveda*. The Sâmaveda was entirely made up of extracts from the R'igveda, put together to suit the ritual of the so-called Soma sacrifices. The origin of the Yajurveda is similar; it, too, is chiefly composed of verses from the R'igveda, but with new mantras added to suit a widened sphere of ritual. Hence the orthodox Hindu regarded the Yajurveda with especial predilection, as practically best adapted to his use; while all the sacredness of the Sâmaveda and Yajurveda, and the belief in their inspired character, rest on the assumption that they are of the same origin as the R'igveda, which dates from eternity, and which was 'seen' by the R'ishis who uttered it. (See the article 'The Inspired Writings of Hinduism,' *Westminster Review*, 1864, Jan.)

All, therefore, that is left of the oldest Veda in the Sâmaveda and Yajurveda is a R'igveda piecemeal; its hymns scattered about; verses of the same hymn transposed; verses from different hymns combined, and even

the compositions of different poets brought into one and the same hymn, as if of the same authorship. Under such treatment the Yajurveda lost all poetical worth; and it is surprising that the Sâmaveda should have saved so much as it possesses. The *Atharvaveda*, too, is made up in a similar manner as the Yajurveda, except that the additions in it to the garbled extracts from the R'igveda are more considerable. It is avowedly the latest Veda; and its use seems to have been not 'for the sacrifice, but merely for appeasing evil influences, for insuring the success of sacrificial acts, for incantations, etc.;' but on this very ground, and perhaps on account of its pervading mysteriousness, it obtained, among certain schools, a degree of sanctity beyond the older Vedas.

From the general character of these four Vedas, we turn to glance at their special contents.

For the religious ideas expressed in the *R'igveda*, see INDIA—*Religion:* see also, besides the deities mentioned there, VARUN'A: VÂYU: YAMA: and J. Muir's *Contributions to a Knowledge of Vedic Theogony and Mythology*, in *Journal of the Royal Asiatic Society*, 1864. The social condition of the Hindus, as reflected from the hymns of the R'igveda, is not that of a pastoral or nomadic people, as is sometimes supposed, but indicates an advanced civilization. Frequent allusion is made in them to towns and cities, to mighty kings and their prodigious wealth. Besides agriculture, they mention various useful arts—e.g., weaving, melting precious metals, fabricating cars, golden and iron mail, and golden ornaments. The uses of the needle and of musical instruments are known to them. They prove that the Hindus of that period sometimes engaged in naval expeditions; and that they had some knowledge of medicine, and had made some advance in astronomical computation—mention being made of the adoption of an intercalary month, for adjusting the solar and lunar years. They were acquainted with the vices of civilization, for we read in these hymns of common women, of secret births, of gamblers and thieves. There is also a curious hymn which indicates that the complicated law of inheritance, one of the peculiarities of the existing Hindu law, was to some extent in use at one of the periods of the R'igveda hymns. The institution of caste, however, seems to have been unknown; for there is no evidence that the names later current for distinction of caste were used in the same sense by these poets. See Wilson's *Rigveda*, I., re-edited by F. E. Hall, II., III.; and IV., ed. by E. B. Cowell (Lond. 1850–66).

The only recension in which the Sanhitâ of the R'igveda has been preserved to us is that of the *S'âkala* school. The number of *padas*, or words, in this Sanhitâ is stated at 153,826. In eight out of the ten Man'd'alas or divisions, the first hymn or hymns are addressed to *Agni;* the next hymn or hymns generally to *Indra;* after these come hymns to the *Vis'we Devâs*—the deities collectively—or hymns to other special deities. The text of the Sanhitâ, with the commentary of Sâyan'a, has been pub. by Prof.

Max Müller. Of translations, the first vol. of one by Max Müller appeared 1869; that by Prof. H. H. Wilson follows the commentary of Sâyan'a, based on Hindu tradition; that begun by Prof. Benfey in the journal *Orient und Occident* (Gött.) is essentially speculative.

The Brâhman'a portion of the R'igveda is preserved in two works only—the *Aitareya Brâhman'a;* and the *S'ânkhâyana*, or *Kanshîtaki-Brâhman'a.* The following are specimens from the former, showing the manner in which works of this category enjoin sacrificial rites and explain their secret meaning. The first relates to the ceremony of carrying the Soma (q.v.). Vâch, the goddess of speech, having been sold under the form of a woman to the Gandharvas in exchange for the king Soma, whom the gods desired, afterward returned to the gods; and the Brâhman'a proceeds thus: 'In imitation (of this precedent), men drive away an immaculate cow of one year's age, this being the price at which they purchase the king Soma. This cow may, however, be rebought; for *Vâch* returned to the gods. Hence the Mantras, after Soma has been bought, are to be repeated with a low voice. After Soma has been bought, the goddess of speech is with the Gandharvas; but she returns as soon as the ceremony of carrying the sacred fire is performed.'

The following are speculations of this Brâhman'a on the meaning of the sacrificial animal: 'The man who is initiated (into the sacrificial mysteries) offers himself to all deities. Agni represents all deities, and Soma represents all deities. When the sacrificer offers the animal to Agni and Soma, he releases himself from being offered to all deities. Some say: "The animal to be offered to Agni and Soma must be of two colors, because it belongs to two deities." But this precept should not be attended to. A fat animal is to be sacrificed, because animals (compared to the sacrificer) are fat, and he (compared to them) is lean. When the animal is fat, the sacrificer thrives through its marrow. Some say: "Do not eat of the animal offered to Agni and Soma: who eats of this animal eats human flesh, because the sacrificer releases himself (from being sacrificed) by means of the animal." But this precept, too, should not be attended to. The animal offered to Agni and Soma was an offering to Indra, for Indra slew Vr itra through Agni and Soma; . . . and they receive (now as their food) the animal which is sacrificed the day previous to the Soma feast. This is their everlasting portion chosen by them; hence one ought to take pieces of it, and eat them.' See M. Haug's ed. and transl. of the *Aitareya Brâhman'a* (II., 59, 78), I., II. (Bombay 1863).

The principal object for which the *Sâmaveda* was compiled is the performance of those sacrifices of which the juice of the Soma (q.v.) plant is the chief ingredient; of which sacrifices the most important is the *Jyotisht'oma.* The Sanhitâ of the Sâmaveda is preserved in two recensions: one of the *Rân'âyanîya* and probably also one of the *Kauthuma* school. The text, in the Rân'âyanîya re-

cension, has been ed. and transl. by Dr. J. Stevenson (Lond. 1842–3) and by Prof. Th. Benfey (Leip. 1848).

The number of *Brâhman'as* relating to the Sâmaveda is by the native authorities given as eight. A later Brâhman'a, probably of modern date, also the *Vans'a-Brâhman'a*, have been ed. by Prof. A. Weber.

The history of the Yajurveda is marked by an important dissension between its own schools, known by the distinction between a Yajurveda, called the *Black*, and another, called the *White Yajurveda*. There is reason to assume that the division took place after the time of the grammarian Pân'ini (q.v.). The Black is the older of the two: the White contains texts not in the Black, and, compared to the motley character of the former, it looks 'white' or orderly. The more orderly arrangement of the White points to a period when the material of the old Yajus was brought into a system consonant with prevalent theories, literary and ritual. The contents of both divisions are similar in many respects. Two of the principal sacrifices of which they treat are the *Dars'apûrn'amâsa*, or the sacrifice to be performed at new and full moon, and the *As'wamedha*, or the horse-sacrifice, at which 609 animals, domestic and wild, were tied to 21 sacrificial posts. The text of the Black Yajurveda is extant in two recensions (see publications by Dr. E. Roer and E. B. Cowell in *Bibliotheca Indica* [Calcutta 1860–64]). The *Vâjasaneyi-Sanhitâ*, or the Sanhitâ of the White Yajurveda, exists in the recensions of two schools; in parts ed. by Prof. A. Weber (Berlin 1852). The principal Brâhman'a of the Black Yajurveda is the *Taittirîya-Brâhman'a* (see pub. by Baboo Rajendralâla Mitra [Calcutta 1860–65] in *Bibliotheca Indica*). That of the White Yajurveda is the *S'atapatha-Brâhman'a*, most complete and systematic of all Brâhman'as; ed. by Prof. A. Weber (Berlin 1855).

The Atharvaveda has no circle of sacrifices assigned to it: its object is to teach how to appease, to bless, to curse, etc. Prof. Whitney (one of its editors) remarks that its most prominent characteristic 'is the multitude of incantations which it contains; . . . directed to the procuring of the greatest variety of desirable ends,' from long life, or the downfall of enemies, 'down to the growth of hair on a bald pate.'—*Journal of the American Oriental Society*, III., 308. The adherents of the Atharvaveda argue that the three other Vedas enable a man to fulfil the *dharma*, or religious law, but that the Atharva helps him to attain *moksha*, or eternal bliss. This doctrine is laid down, e.g., in the *Chûlika Upanishad* of this Veda, when it says: 'Those Brâhmans and others who know the science of the (neuter) Brâhman contained in the *Brahmaveda* become merged in Brâhman.' Its frequent name *Brahmaveda* is held to indicate it as the Veda which contains the mysterious doctrine of Brahman, the supreme spirit, into which the human soul becomes finally absorbed. It seems thus to have become invested, in the mind of its followers, with a spiritual character, afterward developed in the numerous Upanishads (q.v.) now connected with it. Its text is pre-

served only in the *S'aunaka* school. Its Sanhitâ has been edited by Profs. R. Roth and W. D. Whitney (Berlin 1856). The only existing Brâhman'a of this Veda is the *S'aunaka-* or *Gopatha-Brâhman'a* (see Müller, *Anc. Sanskrit Lit.*, 452).

For the theosophical works which grew out of these Vedas, see UPANISHAD; and for the works composed in order to secure correct reading and understanding of the Vedic texts, and correct performing of sacrificial acts, see VEDÂNGA.—At a later period the name Veda was given also to *Itihâsas*—legends or legendary works—and *Purân'as* (q.v.), collectively; but in this sense it never obtained currency. *Upavedas*, or minor Vedas, sometimes mentioned, are various ancient works on medicine, music, archery, mechanical science, etc.

In the preceding brief outline of the four Vedas, the question as to the date of their composition has not been raised, because in the present condition of Vedic philology an answer could be only hypothetical. From astronomical facts, based on a statement in a Vaidik calendar, Colebrooke concluded that this calendar was written in the 14th c. before the Christian era (*Miscell. Essays*, I., 109, 110); and though subsequent writers have questioned the full correctness of this conclusion, those most trustworthy admit that the error, if any, could not lessen the antiquity of this calendar by more than 100 or 200 years. As this calendar must have been composed after the R'igveda had been arranged, and as such an arrangement would probably be posterior to the date of its last hymn, a full scope is left for imagination. Scientific research has as yet not yielded any means either to check or to prompt this work of imagination; nor is there any prospect that future discoveries in Sanskrit literature will supply this lack. As to the *relative* age of these Vedic writings, there is much already brought forward in this respect to prove that there are R'ishis ancient and less ancient; that there are R'igveda hymns older than others (see Müller's *Anc. Sanskrit Lit.*). The theory, however, is utterly baseless that all the Brâhman'as belong to one period, and all the hymns to a period preceding. It is certain that a Brâhman'a of the R'igveda must be posterior to those hymns of the R'igveda Sanhitâ which it mentions; also that a Brâhman'a of the Sâmaveda must be younger than the hymns of the Sâmaveda on which it relies: but no inference can hence be drawn as to the periods of *all* the Brâhman'as and of *all* the hymns. (See the *Hymns of the R'igveda in the Sanhitâ and Pându Texts*, by F. Max Müller, 2 vols.)

VEDÂNGA, *vā-dâng'gâ* [from *Veda*, and *anga*, limb, literally, 'the limb of (the body of) the Veda']: six Sanskrit works, whose object is to teach how to read and understand correctly the Vedic texts, and how to apply them to sacrificial purposes—treating, in this view, of a variety of subjects.—At a later period, these works were supplemented by a similar class of works, which, however, merely describe the domestic ceremonies—e.g., the marriage rite, rites to be performed at various periods before a child's birth, at his birth, at naming him, cutting his hair, etc. Still later a further supplementary class of works was produced; then these two last classes of Sûtras (q.v.)—not comprised among the Kalpa (q.v.) works—grew into the *Dharma-s'âstras*, or law-books, of which that of *Manu* is chief representative. (See Müller's *Anc. Sanskrit Literature*).

VEDÂNTA, *vā-dân'tâ* [from *Veda* (q.v.), and *anta*, end; literally, 'the end or ultimate aim of the Vedas']: second great division of the *Mîmânsâ* (q.v.) school of Hindu philosophy—being also the most impressive structure of that philosophy. It is the most intellectually developed creed of Hinduism; and on it as a basis the popular forms of Hindu religion are reared. The germs of the V. are in the Mantras of the Veda: see VEDA. It is concerned chiefly in the investigation of *Brahman* (neuter), or the supreme spirit (see BRAHMA), and the relation in which the universe, and especially the human soul, stands to it; and in contradistinction from the *Pûrvamîmânsâ*, or the investigation (*mîmânsâ*) of the former (*pûrva*) part of the Vedas—viz., the Sanhitâ, and especially the *Brâhman'as* (see VEDA)—which contain the *dharma*, or religious law (see MÎMÂNSÂ), it is called also *Uttara-mîmânsâ*, or the investigation (*mîmânsâ*) of the latter (*uttara*) part of the Vedas—viz., *Aran'yakas* and *Upanishads* (q.v.), which treat of (the neuter) *Brahman*, or the supreme spirit [not to be confounded with (the masculine) *Brahman*, or the god of the mythological *Trimûrti* (q.v.)]. Sometimes it is named 'the investigation of the soul.' In its method, the V. differs (1) from the *Nyâya* (see NYÂYA and VAIS'ESHIKA) by endeavoring to explain the universe as a successive development from one ultimate source or principle—whereas the Nyâya, in both its divisions, treats of the objects of human knowledge of which the universe is composed, under different topics, unconcerned about their mutual relation of effect and cause; (2) from the *Sânkhya* (see SÂNKHYA and YOGA), inasmuch as that system is based on the assumption of a duality of principles whence the universe derives its origin. See INDIA—*Religion*.

The object-matter of the V. is the proof that the universe emanates in a successive development from a supreme spirit or soul, which is called *Brahman*, or *paramât man*; that the human soul is therefore identical in origin with Brahman; that the worldly existence of the human soul is merely the result of the soul's ignorance of this sameness between itself and the supreme spirit; and that its final liberation or freedom from Transmigration (q.v.)

is attained by a removal of this ignorance—that is, by a proper understanding of the V. doctrine.

According to this doctrine, *Brahman* (neuter) is both the efficient and material cause of the world, creator and creation, doer and deed. It is one, self-existent, supreme, as truth, wisdom, intelligence, and happiness; devoid of 'the three qualities,' in the sense in which created beings possess them; and at the consummation of all things, the whole universe is resolved or absorbed into it. From Brahman individual souls emanate, as innumerable sparks from a blazing fire. The soul, therefore, is neither born, nor does it die; it is of divine substance, and, as such, infinite, immortal, intelligent, sentient, true. Its separate existence, as distinct from Brahman, is the cause of its ignorance; and this ignorance, which consists in regarding the world as a reality capable of subsisting without Brahman, has a double power—that of enveloping and projecting. By means of the former, it makes the soul liable to mundane vicissitudes, e.g., the sensations of pleasure, pain, etc. The projective power of ignorance, when encompassing the soul in its fourth condition, or that of pure intellect (its other conditions are waking, dreaming, and dreamless sleep), produces out of the darkness which then prevails the 5 subtile elements—viz., *ether*, which is the substratum of the quality sound; *air*, which arises from ether, the substratum of touch; from air, *fire or light*, the substratum of color; from light, *water*, the substratum of savor; and from water, *earth*, the substratum of smell. From these subtile elements are then produced 17 subtile bodies and the 5 gross elements. The subtile bodies, called also *linga-s'arîra*, because they are bodies (*s'arîra*) which impart to existing beings their individual character (*linga*), are: (1) *the five organs of perception*—viz., the organs of hearing, touch, sight, taste, smell, which arise severally from the *pure* or *inactive* particles of each of the subtile elements: (2) *two intellectual organs*, produced from the *mingled pure* or *inactive* particles of the subtile elements—viz., *buddhi*, understanding, whose function is to arrive at a certainty or conclusion, and *manas* (an organ of volition and imagination), whose function consists in willing and doubting—thinking and referring the external objects to one's own self being two functions common to both of them: (3) *the five organs of action*—viz., the voice, the hands, the feet, the organ of excretion and that of generation, severally produced from the *foul* or *active* particles of each of the subtile elements: (4) *the five vital airs*, produced from the *mingled foul* or *active* particles of the subtile elements—viz., the air breathed forth, which has its place in the forepart of the nose; the air breathed downward, which has its place in the lower intestines; the air which circulates through the whole body; the ascending air, which has its place in the throat; and the descending air, in the middle of the body, which causes assimilation and digestion of food, produces semen, excrements, etc. (Later Vedântists assume ten such vital airs—viz., besides the foregoing, the airs which severally cause retching,

winking, hunger, yawning, and fattening.) The five *gross elements* are the five subtile elements, when, according to a theory derived from a scriptural text, they have become so divided and combined that each of them retains a preponderating portion of itself, and consequently of the quality of which it is the substratum—as ether of sound, etc.—and, besides, smaller portions of the other subtile elements, and the qualities of which they are the substrata. From these gross elements then arise the various (mythological) worlds, and this world too, with bodies which are distinguished as viviparous, or those produced from a womb, as men, beasts, etc.; oviparous, or those produced from an egg, as birds, snakes, etc.; those generated by 'sweat' or hot moisture, as lice, gnats, etc.; and those germinating, as creepers, trees, etc. The soul, when existing in the body, is incased in a succession of 'sheaths.' The first or interior 'sheath' consists of *buddhi*, associated with the organs of perception; the second, of *manas*, associated with the organs of action; and the third, of the vital airs together with the organs of action. These three 'sheaths' constitute the subtile body of the soul, which attends the soul in its transmigrations; and the collective totality of such subtile bodies is the supreme soul, as regarded in its relation to the world; when it is also called 'the soul which is the thread,' or passes like the thread through the universe, or Hiran'yagarbha, or life. The fourth and exterior 'sheath' of the soul is composed of the gross elements; and the collective aggregate of such gross bodies is the gross body of the deity. This whole development being merely the result of ignorance, the soul frees itself from its error by understanding that the different stages in which this development appears do not represent real or absolute truth; and when its error has completely vanished, it ceases to be reborn, and becomes reunited with Brahman, whence it emanated. But since the means of arriving at a final deliverance can be found in only the complete mastery of the truths of the Vedânta, other means, such as the performance of sacrifices or other religious acts enjoined by the Vedas (q.v.), or the practice of Yoga (q.v.), cannot lead to the same result. They may be meritorious, and are even recommended as such, but can effect only an apparent liberation. Of this liberation there are two kinds: one liberation which is effected in lifetime, and enables a man to perform supernatural actions or wonders, as the evocation of the shades of progenitors, going anywhere at will, and similar feats; and another which takes place after death, and enables the soul, not divested of its subtile body, to reside in heaven; but after a time its effect ceases, and the soul has to renew its mundane existence. In order to fit the mind for meditating on these truths, various moral duties are enjoined, and various practices are recommended, especially by later V. writers. Thus, the student of the V. is told not to hurt a sentient being, to speak the truth, not to steal, to practice continence, and not to accept gifts; to remain pure and content, to do penance,

and to study the Vedas; also to remain in certain postures, to practice various modes of suppressing his breath, and the like. These injunctions, however, are extraneous to the doctrine itself, and appear to be a compromise between the old orthodox faith, which requires the performance of religious acts, and a later stage of it, which favors such austere practices as are especially known by the name Yoga (q.v.): see INDIA—*Religion*. The doctrine of *bhakti*, or faith, does not belong to the older V.; it is, however, an interesting feature of the later periods of this philosophy: and the same observation applies to the doctrine of *Mâyâ* (q.v.), or illusion, according to which the world has no reality whatever, but is merely the product of imagination; for the older V., as noted above, teaches merely that the world is not *the truth*, but does not deny its material reality.

The oldest work on this philosophy is attributed to *Bâdarâyan'a*, or *Vyâsa* (q.v.), and is written in the Sûtra (q.v.) style; it is called the *Brahma-Sûtra:* the most important commentary on this work is by *S'ankarâchârya* (q.v.). The text of the Sûtras and this commentary have been ed. at Calc. 1818; also, with a gloss on the latter, in the *Bibliotheca Indica*, Calc. 1863. Of the great number of other commentaries on the Brahma-Sûtras, an important one is by *Râmânuja* (see under VAISHN'AVAS). Among elementary treatises on the V., the most popular is the *Vedântasâra*, by *Sadânanda*, ed. with commentary at Calc. 1829: see this and another commentary, ed. and transl. by Dr. J. R. Ballantyne (*A Lecture on the Vedânta, embracing the Text of the Vedânta Sâra*, Allahabad 1850), who transl. also the beginning of the Brahma-Sûtras.—See very useful compendium of the topics ed. Calc. 1862, and as an appendix to the Brahma-Sûtras, in *Bibliotheca Indica*, 1863.

VEDDAH, or VEDAH, n. *vĕd'â* [native name]: in *ethnol.*, a tribe inhabiting the forests of the interior of Ceylon, probably either the aborigines, or outcasts from the Singhalese. They live in a primitive state, ruled by their own chiefs, and conceal their villages in the depths of the jungle as far as possible from the beaten paths. Their language differs but little from the common Singhalese. They seldom speak; and travellers report that they never laugh. In 1890, they numbered only 200-300.

VEDDER, *vĕd'ĕr*. ELIHU: artist: born New York, 1836, Feb. 26. After studying art in New York, Paris, and Italy, he opened a studio in New York. In 1863 he was elected an associate of the National Acad. of Design, and 1865 a full member. For many years he has made his home in Italy, spending his winters in Rome and his summers in the picturesque old town of Perugia, where he has a villa. Among his best-known paintings are *The Lair of the Sea Serpent, Cumean Sibyl, Greek Actor's Daughter, Young Marsyas*, and the admired illustrations for the *Rubaiyat of Omar Khayyam*.

VEDETTE, n. *vĕ-dĕt'*, or VIDETTE, n. *vĭ-dĕt'* [F. *vedette*, a sentry placed without a fort or camp—from It. *vedetta*, a sentinel, outpost—from *vedere;* L. *vidērĕ*, to see, to view]: a mounted sentinel placed about 300 ft. in advance of the outposts of an army, to keep strict watch on the enemy's movements, and to signal immediately the approach of danger: V. to place outposts to watch the movements of the enemy. VEDET'TING, imp. VEDET'TED, pp. *vĕ-dĕt'-tĕd.*

VEER, v. *vēr* [F. *virer*—from mid. L. *virārĕ*, to turn round—from L. *virĭæ*, a bracelet: It. *virare*, to turn]: to change direction, as the wind; to alter its course, as a ship, by bringing the stern to the wind; 'wear'; to direct to a different course; to let out, with *out*, as to *veer out* a cable. VEER'ING, imp.: ADJ. changing; varying: N. that movement of a ship in changing her course by which her head is turned to leeward. VEER'INGLY, ad. *-lĭ.* VEERED, pp. *vērd.*

VEGA, *vē'gâ* [Ar. *al-nesr-al-wagi*, falling bird]: star of the first magnitude, *alpha Lyræ;* right ascension 18 h. 33 min. 13 s., declination n. 38° 40′ 9″. V. is very nearly at the zenith in the lat. of Washington, D. C., in Aug. Next to *Capella*, it is the brightest star in the n. hemisphere. Its light is intensely white. Computations of V.'s distance vary enormously. Since 1888 V. has been under observation at Yale Observatory, and Dr. W. L. Elkins, of that institution, gives 0·10″ as the value of its parallax—corresponding to 33 'Light Years' (q.v.), or 2,000,000 times the sun's distance. Its spectrum has comparatively few lines, but the hydrogen lines are strong.

VE'GA, GARCILASO DE LA: see GARCILASO.

VEGA-CARPIO, *vā'gâ-kär'pē-ō*, LOPE FELIX DE: Spanish poet: 1562, Nov. 25—1635, Aug. 27; b. Madrid. From his infancy he is said to have given promise of extraordinary talent. Like Pope, he 'lisped in numbers': at the age of 5 he showed fondness for poetry, and was able to read both Spanish and Latin. On the death of his father, the family, originally in good circumstances, fell into great difficulties, and was broken up. The young Lope fell to the charge of his uncle, the Inquisitor Miguel del Carpio, who spared no pains to give him a good education. He was sent to the Imperial College at Madrid, where he showed an astounding memory; and seemed advancing quietly toward the priestly state, to which he had been devoted by his uncle, when an odd whim struck the lad, and at the age of 14 he went off on a roving expedition with a comrade. But he and his companion were speedily arrested as thieves on their trying to effect the sale of a chain of gold (probably stolen from Lope's uncle), and sent back to Madrid. The returned prodigal was coolly received by his reverend relative, who declined to concern himself further with a nephew of such distinctly *lay* propensities. He, in consequence, became a soldier; and 1577 served at Terceira against the Portuguese. After this we find him in the service of Don Geronimo Manrique, Bp. of Avila:

from which position he went to finish his studies at the Univ. of Alcala. Here he was again ripening for holy orders, when again the passion of the vagabond drove him out on the world a pervert. For some time, at this period, Lope disappears from public view; and probably his adventures were of the kind which discreet biographers permit to remain in privacy. It has been conjectured that in his dramatic romance *Dorothea* he afterward incorporated some of these early experiences: if this supposition be true, the blank in his record is no loss. Graduating from Alcala, he became sec. to the young Duke of Alva, at Madrid. Later (about 1584) he married a lady of good condition, Isabella de Urbino; but his domestic felicity was speedily cut short by a misadventure. Having had some difference with a gentleman of court, he satirized him in a filthy ballad; and on finding that he took it amiss, answered his challenge and gave him satisfaction by severely wounding him. For this, with perhaps some other offenses, Lope was thrown into prison, and afterward fled to Valencia. He returned to Madrid after two years; and soon afterward his wife died. He is said to have been deeply attached to her. Grief for her death, complicated with want of success in another of his usual love-affairs, drove him to join the *Invincible Armada*, then being fitted out for conquest of England. From this disastrous expedition he returned with a whole skin; but one of his brothers had been shot by his side. It is characteristic of Lope—who, whatever else he might be doing, was pouring forth torrents of verse—that he composed, amid the distractions of tempest and battle, a long poem, *Hermosura de Angelica*, which, as a continuation of the *Orlando Furioso* of Ariosto, has found favor even with special admirers of that poet. Shortly after his return, he became sec. to the Marquis of Malpica, and subsequently to the Count of Lemos, whose service he quitted soon after his marriage, 1597, to Donna Juana de Guardio, resolving thenceforward to trust to literature for his livelihood, since he had now become one of the most admired authors of the day, and by far the most popular dramatist. The few years immediately succeeding, he frequently afterward referred to as the happiest period of his life. At the age of seven, his son Carlos died; and soon afterward, in giving birth to a daughter, his wife also died. The double blow was severe. A mistress, indeed, remained to console him, Donna Maria de Luxan, by whom he had a boy and girl, the latter of whom, Marcela, was the most beloved of all his children. But he had perhaps grown weary of Donna Maria; and about this time he began to turn his thoughts seriously to religion, after the fashion in which he conceived of it. Accordingly, after an interval of devout preparation, he became, 1609, a priest of the order of St. Francis. Of his zeal in his new functions, there is evidence in the fact that 1623, Jan., he took prominent part in the ceremony of burning a heretical brother of his order. In 1627 Pope Urban VIII. sent him the degree of doctor of theology. As to his performance of priestly duty otherwise, little is known; but it is certain

that, with his old unremitting assiduity, he continued to pour forth poems and dramas, not always of a clerical or decent kind. He long held illicit relations with a married woman, whose daughter by him was publicly baptized at San Sebastian in Madrid, 1617, Aug. 26. This, however, was in his earlier priestly career. It would be natural to judge the man entirely a hypocrite in his turning to religion; yet such a sweeping judgment is not *necessary* in view of his nature and of the moral standards of his country and his times. It is certain that in his last years he fell into a profound religious melancholy. Despite the decay of his strength, he became rigorous in keeping himself up to the severest mark of discipline; in particular, he scourged himself terribly. Finally, for penance, he gave himself a scourging so severe that the walls of the chamber were found bespattered with his blood; and some days afterward he died of it, at the age of 73.

Lope was the idol of his contemporaries; and on the fruits of his labor he lived in Madrid in what might be called splendor, when the greater Cervantes was nearly starving in the same street. To such an extent was the popular admiration of him carried, that his very name became a synonym of excellence; and people spoke of a Lope jewel, a Lope poem, or the like, as one of unsurpassable perfection. For a long time nobody else than Lope de V. was willingly heard on the Spanish stage; and his fame abroad (especially, of course, in Italy and in France) was almost as remarkable. In the Spanish world of letters he was as absolutely dictator as was Voltaire a century and a half later in France. In one quality, at least, Lope must be held to have surpassed all other poets—his productiveness was portentous and without parallel. Setting aside his other multitudinous performances, the dramas on which his popularity mainly rested, and which have since perpetuated his fame, have been calculated to number not less than 1,800. He himself, in one of his latest works, more modestly puts them at more than 1,500, and assures us that to write a whole drama in a day was no unusual feat with him. Even if in this there be something of the fabulous, there remain in print nearly 600 of these pieces; and it is certain that many of his acted plays have not in this form survived. In view of the quantity of his work, its quality is equally surprising. His fertility of invention is marvellous; the ease and grace of his versification are unsurpassed in the language in which he writes; and his pieces, even when slight in substance, are instinct with life and dramatic movement. His drama has been well pronounced the drama of intrigue, not of manners nor of character. In deep and serious qualities he is deficient; on which ground he is now ranked below his immediate successor, and sometime contemporary, Calderon. With this single exception, he remains the chief ornament of the Spanish stage, and a notable figure in the dramatic literature of the world.—An intelligent and full survey of his works, so far as the amazing mass of them permits it to be full, is in Ticknor's *History of Spanish Literature.*

VEG'ETABLE CHEM'ISTRY: the chemistry of plants —a subject so extensive that it is impossible here to give much more than an enunciation of the most important propositions, with little of proofs or details. On submitting to incineration a plant which has been dried at moderate heat till it ceases to lose weight, we find that the residue, which consists of mineral salts and a little carbon, is much lighter than the original plant, the portion which is burned off, or apparently lost, corresponding to the organic constituents of the plant. Hence every plant, like every animal, is composed of *organic* and *mineral* or *inorganic constituents.* While the mineral constituents of the plant are found also in the crust of the earth, the organic constituents are formed primarily in the plant itself from inorganic matters—viz., from *water, atmospheric air,* and the *soil,* which three collectively may be termed the food of plants.

The following general principles may be laid down regarding the organic constituents which mainly contribute to form the bulk of the body of the plant: (1) All organic constituents of plants contain *carbon.* (2) All such organic constituents contain *hydrogen:* some, e.g., many ethereal or volatile oils, consist solely of these two elements. (3) The greater proportion of these compounds contain *oxygen* in addition to the two preceding elements: to this class belong those constituents of plants which are at the same time of most general diffusion and of greatest physiological and economic importance—viz., the so-called *carbo-hydrates,* which consist of carbon combined with hydrogen and oxygen in the exact proportion in which the last two elements form water. Under this title are included cellulose, starch, gum, etc. Other organic constituents contain not only carbon with hydrogen and oxygen in the above ratio, but an excess of oxygen. In this category may be placed almost all the *organic acids,* many *ethereal oils, wax,* the *resins,* many of the so-called *glycosides,* and the *fats.* (4) With the above elements *nitrogen* is associated, to form two very important groups of constituents—viz., the *organic bases* or *alkaloids* and the *albuminates* or *proteine bodies.* Although the nitrogenous groups never form more than a small part of the mass of a plant, nitrogen is never altogether absent from a plant. (5) In association with all the above named elements, *sulphur* in small quantity is present in the albuminates of all plants; in association only with carbon and hydrogen, it occurs in oil of garlic and oil of asafetida; and when combined with carbon, hydrogen, and nitrogen, it has been as yet found only in oil of mustard. Whether *phosphorus* in very minute quantity occurs in any of the vegetable albuminates is still uncertain.

The inorganic constituents found in the ashes of all plants are: *potash, soda, magnesia,* and *lime,* in combination with *phosphoric, sulphuric, hydrochloric,* and *carbonic acids,* and, additionally, *iron, manganese,* and *silica,* with traces of *fluorine;* while the marine plants or sea-weeds contain also appreciable quantities of *bromine* and *iodine.*

Alumina and *baryta* also are occasionally found, as also are *nitrates* in certain plants. The carbonates almost always found in the ash are formed mostly by the action of the incineration on the salts of the vegetable acids, such as the acetates, citrates, etc.; and probably in some other respects the arrangements of the constituents of the ash are not precisely identical with those of the mineral ingredients while existing in the actual plant. Among the most essential of the inorganic constituents is *water*, which acts as a solvent for the matters dissolved in the vegetable juices, and forms a very preponderating part of the mass, amounting sometimes to from 86 to 96 per cent. of the whole plant. From the preceding remarks it is obvious that the nutrition and development of plants is dependent on their absorbing *carbon-compounds, hydrogen-compounds, nitrogen-compounds, sulphur-compounds, water*, and such *inorganic compounds* as yield the necessary inorganic constituents in a form capable of assimilation; together with the presence of *oxygen*, requisite for formation of organic oxygenous compounds.

The assimilation of *carbon* first claims our attention. The composition of the atmospheric air, from whatever part of the earth's surface it is taken, is constant, so far as the relative volumes of oxygen and nitrogen are concerned; while the variations in the carbonic acid, except when there are obvious causes for an excess (e.g., an overcrowded room), are very slight, and, as a general rule, deviate scarcely at all from 4 vols. in 10,000 of air. Yet causes disturbing this uniformity are perpetually at work. Prof. Mulder, adopting Lavoisier's and Davy's experiments, according to which a man consumes about 26 cubic ft. of oxygen in 24 hours (but later observers place the daily quantity at 45 cubic ft.), calculated his yearly consumption at more than 9,500 ft. Considering the enormous numbers of men and animals on the surface of the globe, and the lamps, fires, furnaces, etc., ever burning, the atmosphere would apparently soon cease to be fit for the support of life, (1) in consequence of the great diminution of oxygen, a gas essential to life; (2) in consequence of the great excess of carbonic acid, a gas deleterious to life. The cause of this marvellous uniformity of atmospheric air under these circumstances is that function of plants by which they absorb their carbon. It is to the experiments and observations of Priestley 1771, Ingenhousz 1776, Senebier 1807, and many later observers, that we are indebted for the knowledge of the great general fact that plants take up the carbonic acid from the air, reduce it in their organism, and retain the carbon for the composition of their own organisms, while they restore the oxygen gas to the atmosphere. It is chiefly by the leaves, which may be regarded as the respiratory organs, that this process is carried on. It is needless here to notice the questions as to whether it is only during light, or constantly, that these changes go on; whether different rays of the spectrum act with more or less power in liberating the oxygen; etc. Independently of the proof afforded, e.g., by placing green

plants in a mixture of 70 parts of common air and 30 parts of carbonic acid, and finding that after four hours the carbonic acid has been almost entirely replaced by oxygen, we have obvious evidence in lichens growing on a naked rock that the carbon which they contain must be obtained from the atmosphere. In aquatic plants the process is identical, the atmospheric air being dissolved in the water. Carbon, in some form of combination, probably forms about two-thirds of the weight of a dried plant. The assimilation of *hydrogen* from the decomposition of water in and by the plant, is not capable of the same direct proof as that of carbon; but there are grounds for believing in its occurrence. This view is supported by the composition of wax, the resins, volatile oils, etc.; indeed it is difficult to see from what other source the hydrogen could be derived. In that case the water, like the carbonic acid, contributes its oxygen to the air. The *nitrogen*, which enters into certain constituents of plants, is derived from ammonia, and not, as might have been supposed, directly from the air, of whose volume it forms about four-fifths. It has been shown by the direct observations of Boussingault that plants cannot assimilate nitrogen; that those which have been made to absorb it by placing their roots in nitrogenous water throw it off unchanged; and that vegetation cannot exist in a soil which contains no substances readily convertible into ammonia. The indifference of nitrogen to other elements, and the extreme readiness with which ammonia becomes decomposed, and enters into different combinations (the amides, imides, amido-acids, compound ammonias, probably also the albuminates, being derivatives of it), together with the conclusion drawn from the action of liquids containing ammonia, or matter convertible into it, e.g., gas-liquid, fluid sewage, etc., confirm this view. The ammonia taken up by plants is obtained partly from the air, partly from the soil. In the air it is formed after thunder-storms, and it is further supplied to the atmosphere by putrefactive processes, animal excretions, and volcanic action. It is indeed found in snow and in all rain-water, and is thus conveyed to the soil. Although direct experiments show that the air contained in the pores of the soil is richer in ammonia than ordinary atmospheric air, it is easy to show that a plant can derive its ammonia from the latter alone, by a reference to the vegetation on naked rocks, or by growing plants in powdered charcoal duly moistened with rain-water. Hence both air and soil contribute the ammonia from which the nitrogen is fixed in the plant. The *oxygen* which occurs in the various constituents of the plant is derived from the decomposed carbonic acid and water, and corresponds to the difference between the amount contained in those absorbed compounds and the amount liberated to the atmosphere. The *sulphur* that occurs in the albuminates and certain ethereal oils must be derived from the soil, since it does not occur either free or in combination in the air; and as the only form in which it is found in common soil is as sulphates, plants must have the property of de-

composing these salts, and appropriating their sulphur after reduction. Extensive experience has proved that certain *inorganic constituents* are as indispensable to the life and development of the plant as the organic elements that we have been considering; and further, that special plants require special inorganic constituents (see works on agricultural chemistry). The two following facts seem established: (1) that the roots of plants exert a special selective power, and absorb some salts, and reject others that are also in solution in the water of the soil; (2) that the top or vegetable soil has the power of absorbing and retaining the most necessary mineral ingredients, and does not allow them to be carried deep into the ground by the rain; but for discussion of this subject, see experimental researches of Liebig, Mulder, Huxtable, Way, etc. It would be out of place here to enter into the consideration of the prodigious synthetic and analytic power of the vegetable cells.

VEG'ETABLE I'VORY: see IVORY, VEGETABLE.

VEG'ETABLE PARCH'MENT: see PARCHMENT (PARCHMENT-PAPER).

VEG'ETABLE PHYSIOL'OGY: branch of botany which treats of the life of plants and the functions of their various organs. For the most important departments of this subject, see CIRCULATION OF SAP: FLOWER: FRUIT: LEAVES: METAMORPHOSIS OF ORGANS: PLANT: ROOT: SEED: SPORE: STEM: ETC. We shall here discuss only one subject—viz., the organs and functions of reproduction in plants. Although, as we learn from Herodotus, the Babylonians knew that there were male and female date-trees, and that the female required the concurrence of the male to become fertile, and Theophrastus, in his work *On the History of Plants*, and other ancient authors, frequently mention the sexes of plants, yet Cæsalpinus, who died at Rome 1603, seems to have been the first writer who directed his attention to the reproductive organs of plants, and he speaks vaguely of an emanation from the male causing fertility in the female; and Grew, 1676, seems to have been the first who distinctly recognized the functions of the stamens and pistils. Ray, in his *Historia Plantarum*, 1694, adopted and enforced Grew's view; and Geoffroy, 1711, supported the same view in a Memoir before the Royal Acad. Linnæus, in *Systema Naturæ* (1748), made these organs the foundation of his system of classification into sexual and non-sexual plants, the former being phanerogamous, or flowering, and the latter cryptogamous, or flowerless; in the latter division of plants he could not detect stamens or pistils; and it was not till 1782, when Hedwig's work on Mosses was published, that anything was known with certainty regarding the sexual organs of any of the cryptogamia.

We proceed to consider reproduction in the phanerogamous plants. A complete flower consists of four whorls (*verticils*), placed alternately within one another, the two internal being the *Stamens* (q.v.) and *Pistils* (q.v.), which are the essential organs of reproduction; while the two external are the *calyx* and *corolla*, which constitute the floral envelopes or protective coverings. Both the stamens and the pistils originate, like the floral envelopes (see FLOWER), from the thalamus, or upper part of the axis or peduncle, in the form of minute cellular processes; and in their development they resemble leaves, though in their appearance they are less like leaves than are the floral envelopes. These parts are shown in the following diagram (fig. 1) of the flower of the vine, after it has cast its petals. There are here five stamens (the filament of one being concealed by the pistil), with introrse* two-lobed anthers. For the anatomical structure of STAMENS and PISTILS, see those titles. Additional remarks on the pollen are here given. This (the male fertilizing agent) consists of cells contained in the anther-case, and is discharged by various kinds of longitudinal, transverse, valvular, or porous dehiscence. When examined by the naked eye, it appears usually as a yellow powder;

* *Introrse* is applied to anthers which open on the side next the pistil.

but when magnified, it is found to consist of cellules of different singular forms, varying in size from $\frac{1}{300}$ to $\frac{1}{700}$ of an inch in diameter. Oval, spherical, and triangular forms of pollen are shown in figs. 2 to 6; and they may be square, cylindrical, hour-glass shaped, etc. These pollen-grains are developed in the large cells in the early stage of the anther. The contents of each cell divide first into two, and afterward into four parts, each of which becomes covered with cellulose, so as to constitute independent cells or grains. These grains either burst through the parent cell, and become liberated, or they remain united in fours or some multiple of four, as in many species of acacia; or in large masses, such as those seen in Orchids and in Asclepias, when they constitute *pollinia*. Each pollen-grain has usually two coverings: the outer one, called *extine*, being a firm membrane, often marked with bands

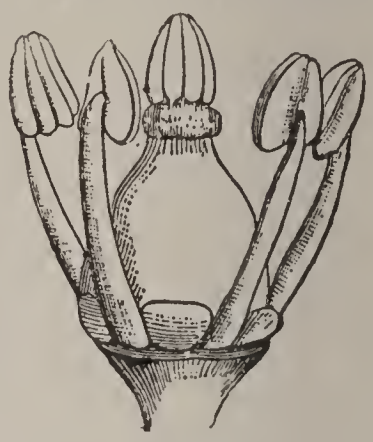
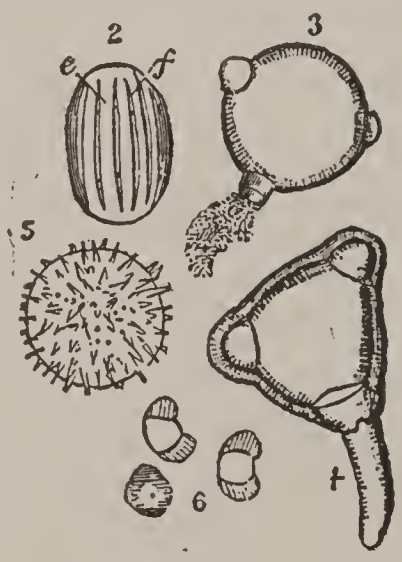


Fig. 1.
Andrœcium and Gymnœcium (or, in other words, the stamens and pistil) of the Vine, with the disk surrounding the base of the ovary.



Figs. 2 to 6.

Fig. 2.—Elliptical Pollen of Milkwort (*Polygala*), viewed lengthwise. Its surface, or extine, *e*, is marked with grooves or slits, *f*, where the intine protrudes. Fig. 3.—Ripe round Pollen of Cherry (*Cerasus*) discharging its fovilla through a tubular opening formed by the intine. There are two other points at which the intine is seen protruding. Fig. 4.—Triangular Pollen of Evening Primrose (*Œnothera*), with one pollen-tube protruding. This tube is formed by the intine, which is also seen projecting at the other angles. Fig. 5.—Round ripe Pollen of Hollyhock (*Alcea*), with its extine covered with prominent points. Fig. 6.—Pollen of Fir (*Pinus*), in which, by the increase of the intine, the extine is separated into two hemispherical portions marked by the dark spaces at each end of the grains.

or rough points; and the inner one, called *intine*, which is thin, and capable of extension. In the interior of the pollen-grains a minute granular matter exists, called

fovilla—the granules, which are mixed with starch and oil, varying from $\frac{1}{4000}$ to $\frac{1}{30000}$ of an inch in diameter. On moistening pollen-grains in water, they swell till the *intine* bursts at one or more points, and expels the fovilla. In the act of impregnation, the pollen is scattered on the pistil, and is moistened on one side by the fluid of the stigma (a part of the pistil composed of loose cells which secrete a viscid fluid and are uncovered by epidermis). It is then observed that the intine, instead of bursting, protrudes in the form of a tube called the *pollen-tube*. The number of these tubes varies greatly in different plants. According to Amici (as quoted by Balfour), the two pollinia (fig. 7) of *Orchis morio* contain each about 200 secondary small masses, composed of grains united in fours; and each of these small masses presents 300 openings capable of emitting tubes. In order that an embryo plant may be formed, the mature pollen must be discharged from the anther-cells of the stamen, and brought into contact with the stigma, through which, and then through the conducting tissue of the style, it must pass until it reaches the foramen, or micropyle, of the ovule. The means by which this contact is accomplished are various, such as elasticity and irritability of the stamens, the action of currents of air, and the intervention of insects passing from the male to the female plant. In the orchids, fertilization is effected by the agency of insects. The fertilizing power of pollen is retained for a different length of time in different plants: thus, in most species of Datura, and in *Lychnis dioica*, it loses its power in two days; in the wall-flower it remains efficacious 14 days; in the date, cannabis, tea, and camellia, it will keep fresh for a year; indeed, Micheaux mentions that the pollen of the date has been successfully used after 18 years. The quantity of pollen produced is much greater than is actually required for impregnation of the ovules: thus, in the Firs and Pines the quantity is enormous, probably because of the obstacles presented to their fertilization. The *sulphur showers* occurring in some districts are composed of the yellow pollen carried by the winds from pine-forests; and the showers of colored rain occasionally noticed are due to a similar cause. The number of pollen-grains in certain flowers has been calculated. In a plant of *Cereus grandiflorus*, Morren observed that there were 40 flowers, each containing 500 stamens, and that each anther contained 500 pollen-grains; hence the entire number of pollen-grains in each flower was 250,000, and in the whole plant was 10,000,000. Similarly, in an entire Rhododendron plant the pollen-grains amount to 72,620,000. The quantity required for fertilization is

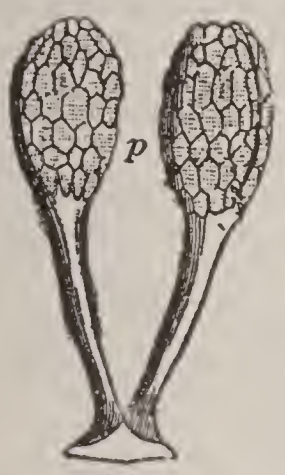


Fig. 7.
Pollinia, or Pollen-masses, of Orchis, separated from the point above the stigma, with their viscid matter adhering to them at the base. The pollen-masses, *p*, are supported on stalks.

very small—one, two, or at most three grains being sufficient to impregnate one ovule. In most cases the pollen of a single anther is sufficient for complete impregnation; the additional anthers making more sure the result. During the evolution of the stamens, and the maturing of the pollen, the pistil undergoes certain changes, of which the most important is that the stigma becomes enlarged, lax, and covered with a viscid secretion, which, besides detaining the pollen-grains, causes them to protrude their tubes, as above described; moreover, in some flowers, the style, which is sometimes covered with hairs, elongates during the discharge of the pollen, brushes the latter on to the pistil, and thus acts directly in fecundation. One of the central cells of the ovule now becomes much enlarged and developed, so as to form the embryo-sac. At the end of this sac, next to the micropyle, several free nucleated cells are formed, to which the name embryo-vesicles, or germinal vesicles, has been given. In this way the ovule is prepared for the action of the pollen and for production of the embryo plant. The tubes developed by the pollen-grains, when acted on by the secretion of the stigma, pierce the stigmatic tissue, and carry the fovilla through the canal of the style to the ovule (see figs. 8, 9, and 10). In some plants the emission of tubes begins in half a minute after the pollen has been caught by the stigmatic secretion; in other plants it does not begin till after 24 hours; and it is said that in the larch the tubes do not emerge till after 35 days. The length to which the tubes extend is often very great, but the diameter is extremely small. In *Colchicum autumnale*, in which the style is 13 inches long, the length of the tube is 9,000 times the diameter of the grain from which it proceeds. The time taken by the tube to traverse the length of the style varies, but does not always correspond with the latter. In some short-styled plants the time is very long; but in the long-styled *Colchicum autumnale* the pollen-tube reaches the ovule in about 12 hours. In some coniferous plants a year is required for the process.

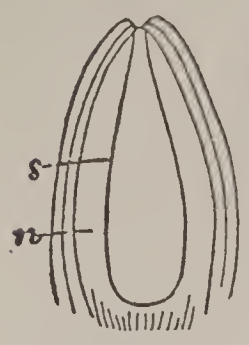


Fig. 8.
Ovule of Polygonum, showing the embryo-sac, *s*, developed in the midst of the nucleus, *n*.

Fig. 9.
Vertical section of the upper part of the pistil of Frogsmouth (*Antirrhinum majus*). Two pollen-grains are seen lying on the stigma, *stig*. These send out tubes, *tp*, which pierce the stigma and penetrate the tissue of the style, *styl*, until they reach the ovules or young seeds.

We proceed to consider the embryogeny of (1) Gymnospermous and (2) Angiospermous Phanerogams. In the gymnospermous or naked-seeded flowering-plants, such as

the coniferæ and cycadaceæ, impregnation is effected by direct contact between the pollen and the ovule, there being no true ovary bearing a stigma. The process is thus summarized by Balfour: 'In gymnospermous plants there are stamens containing pollen, and ovules supported on cones or altered branches, and in them the pollen enters the large micropyle of the ovule without the intervention of stigma or style When the pollen reaches the nucleus of the naked ovule, it remains long dormant, and after many weeks and months sends out a tube which reaches the embryo-sac and impregnates a corpuscle. One of the cells of the corpuscle then takes an active function, and develops the embryo with the suspensor in the midst of endospermal cells.'—In the angiospermous phanerogams, when the pollen-tube has traversed the tissue of the style, and reached the ovule, it

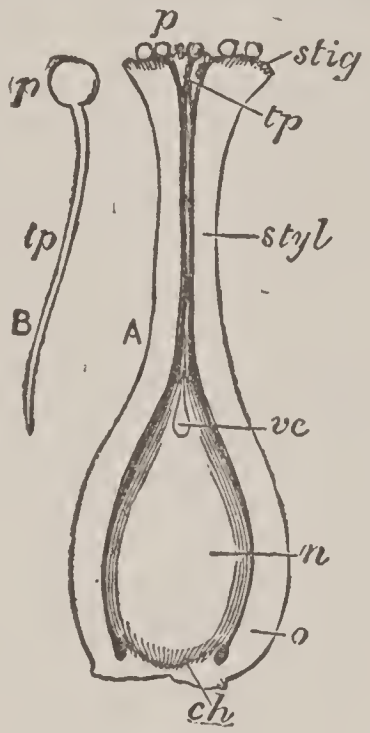


Fig. 10.

Pistil and Pollen of Polygonum. A, stigma, *stig*, with pollen-grains, *p*, adherent to it, sending tubes, *tp*, down the conducting tissue of the style, *styl*; the ovary, *o*, containing the ovule with its covering and central cellular mass or nucleus, *n*, containing a rudimentary embryo-sac *ve*, in which ultimately the embryo is developed. The base of the ovule, attached to the placenta, is marked by the chalaza, *ch*. B, pollen-grain, *p*, separated, with pollen-tube, *tp*.

proceeds through the foramen, or micropyle, so as to come in contact with the embryo-sac; and consequent on this is the development of the cellular embryo. There is, however, much dispute as to what now occurs. 'Schleiden thinks that the end of the pollen-tube introverts the embryo-sac, and in some cases perforates it, and that it becomes the first cell in the embryo. Most physiologists, however, agree in thinking that Schleiden was mistaken in regard to the extremity of the pollen-tube, and they believe that the embryo is formed from a distinct cell previously existing in the embryo-sac. In some instances

the pollen-tube indents the embryo-sac; at other times it perforates it, and comes into actual contact with a cell contained in the sac. In the embryo-sac there are produced, before impregnation, certain cells, often three, called germinal vesicles, only one of which in general is impregnated by the pollinic fluid, which transudes through the membrane of the pollen-tube and the walls of the embryo sac and vesicles. After impregnation the vesicle divides by a transverse septum into two parts—the upper portion forming a confervoid partitioned filament or suspensor, and the lower becomes filled with cells, constituting the rudimentary embryo. The suspensor is attached to the part which forms the radicle of the embryo, and at the opposite end one or two cotyledons are produced, inclosing the fresh bud or plumule. An embryo is usually produced in each ovule (monembryonomy); but when more than one germinal vesicle is impregnated, there is a plurality of embryos (polyembryonomy). When the pollen of one species is applied to the pistil of another species, we occasionally find seeds produced which give rise to individuals intermediate between the two parents: these individuals are called hybrids or mules, and are rarely fertile. A plant has, however, a preference for the pollen of its own species, and hence hybrids are rare in nature.' (Balfour.)—A reference to the preceding figure of a section of part of the ovule of a species of *Speedwell* will elucidate the above summary: it shows the pollen-tube, *a*, just as it reaches the embryo-sac which contains the rudimentary embryo, *d*, attached to the sac by its, suspensor, *b*, and endospermal cells, *c*, at the lower part of the sac. The suspensor is sometimes of considerable length, and as much as three or even five times the length of the whole seed. Its attachment to the radicular end of the embryo is shown in fig. 11. In monocotyledons a single sheathing cotyledon is developed; in dicotyledons two opposite leaves; and after their formation the apex produces the terminal bud or plumule. The embryo is thus suspended in an inverted position in the seed.

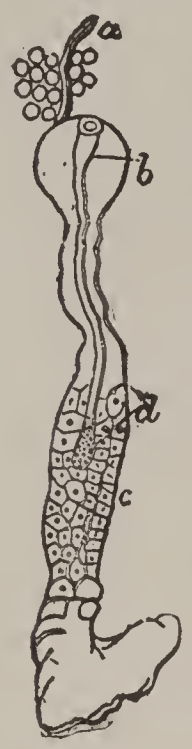


Fig. 11.
Section of part of the Ovule of a species of Speedwell (*Veronica iriphyllos*), showing the pollen-tube, *a*, passing through the cellular tissue of the nucleus, and reaching the embryo-sac, which contains the rudimentary embryo, *d*, attached to the sac by its suspensor, *b*, and endospermal cells, *c*, at the lower part of the sac.

It is impossible to enter into any general description of the organs or process of reproduction in cryptogamic plants. In the higher classes of this great division of the vegetable kingdom, the organs of reproduction consist usually of cellular sacs of two kinds—one called *antheridia*, containing *phytozoa* or *spermatozoids*, representing the stamens, or the male; and the other called *pistillidia* or

archegonia, and representing the pistil, or the female. These structures, in a magnified state, are shown in figs. 13 and 14, as they occur in the liverwort. In the fully developed state of the plant, the antheridia disappear, while the pistillidia are transformed into cellular sacs containing germinating bodies known as Spores (q.v.), which are considered as formed by a process of reproduction, and as analogous to cellular embryos. These spores are developed in mother-cells, whose contents often divide into four, such mother-cells being called sporidia. With regard to the antheridia and the pistillidia in the different orders of cryptogamic plants, Dr. Balfour observes that in ferns they are supposed to exist in a prothallus or cellular expansion produced by the spore when it germinates. A cell of the pistillium (the ovular body) afterward gives rise to the spore-bearing leaves (the fronds). After impregnation the archegonial cells give rise to a sporingiferous frond.

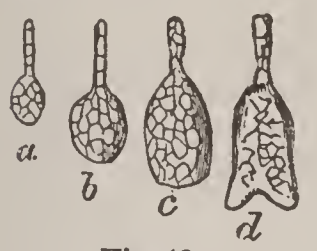


Fig. 12.

The embryo in different stages of development: *a*, Embryo in young state as a globular mass at the end of a suspensor; *b* and *c*, Embryo more advanced; *d*. Embryo showing the division into two cotyledons.

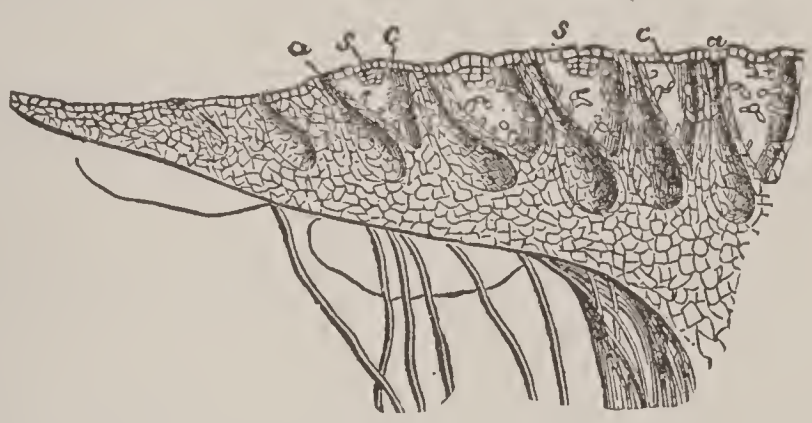
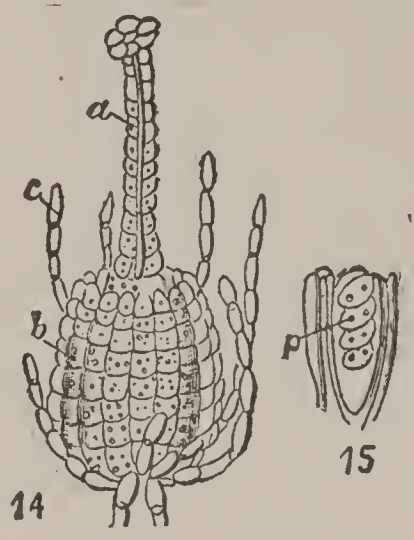


Fig. 13.

Vertical section of the disk-like receptacle of Liverwort (*Marchantia*), showing the antheridia, *a*, *a*, in its substance. These antheridia are flask-shaped sacs containing phytozoary cells. They communicate with the upper surface and their contents are discharged through it. Between the antheridia there are air-cavities, *c*, *c*, connected with stomata, *s*, *s*.

The spores are contained in sporangia, with or without an elastic ring, developed on the back, on the side, or at the base of the leaves. In mosses these organs are seen at certain stages of the plant's growth, and they are either on the same or on different plants. After impregnation the archegonial cell gives rise to a stalked theca or sporangium with its spores. In liverworts they are usually on different parts of the plant, and as frequently in the substance or on the under-surface of disk-shaped cellular stalked expansions. Here the impregnated cell gives rise to the fruit or capsules. In lichens the existence of these organs has not yet been established; and the fructification consists of *thecæ* or *asci*, containing 4, 8, 12, or 16

sporidia (or cells containing spores) in their interior. (In fig. 15 a theca containing four sporidia is shown.) These thecæ are usually united together so as to form a cup-like mass of fructification. When mature, the sporidia or thecæ burst, and discharge the spores. The fungi, antheridia, and pistillidia are obscure, and the organs of reproduction are spores which are either naked or are contained in thecæ. In algæ, antheridia and pistillidia have often been detected; but in some of them certain cells, in the



Figs. 14 and 15.

Fig. 14.—Pistillidium of Liverwort. It is a cellular body surrounded by an involucre, *b*, and septate filaments, *c*, and is provided with a styloid calyptra. Fig. 15.— A Theca of a Lichen, containing four nucleated cells. These cells ultimately form the sporidia or sacs containing numerous minute spores. Round the theca are cellular filaments, *p*.

same or separate filaments, seem to possess the property of producing spores by a process of conjugation or union; and in the lowest forms the cells undergo division into new individuals.

Besides the above-noticed modes of propagation, cryptogamic plants are propagated also by buds or gemmæ, which are either attached to the leaves or fronds, or are contained in peculiar cup-shaped bodies. For other modes of reproduction, briefly indicated, see BOTANY; also Sachs's *Textbook of Botany* and Bessey's *Botany for High Schools and Colleges.*

VEGETA'RIANISM: the doctrine that vegetable substances are the solids intended by nature for the sustenance of man, and that it is wrong—against nature and against good morals—for men to make use of an animal diet. There have never been wanting among speculative persons some who maintained that fruits and vegetables are the proper food for men; and illustrious names, such as those of Pythagoras, Plato, Plutarch, in ancient times—of Rousseau, Shelley, Swedenborg, in modern—are among upholders of this doctrine. A society for promoting the practice of V. was established at Manchester, England, 1847; and three years later a similar society was established in the United States. V. has attracted very few disciples; and by these its advocacy has usually been conjoined with

that of temperance, peace, homœopathy, and the cold-water cure.

There is, first, a physiological argument used in behalf of V. It is said that the formation of the teeth and of the intestines in man proves that man was intended to be not a carnivorous, but a fruit and vegetable eating animal. Then it is maintained that a vegetable diet is the most favorable to man, in all respects, physical, intellectual, and moral; that with it his life is longer, his enjoyment of life greater, his brain more vigorous, and his power of manual labor not less than with an animal diet; and that, while the use of animal food begets ferocious dispositions, a carelessness about life, a callousness to the sufferings of men or animals, a vegetable diet 'develops the gentler affections, and produces a broad and genial sense of brotherhood.' It is affirmed that animal food produces febrile and inflammatory tendencies; that, like alcohol, it is a stimulant (some vegetarians call it a stimulating poison); and that a mixed diet is open to all the objections which lie against moderate drinking. It is alleged also that animal food as exposed for sale is often tainted with some disease or unwholesome condition, and it thus becomes a frequent cause of disease. Moreover, it is submitted that vegetables contain all the principles necessary for human sustenance; that, therefore, the use of flesh is unnecessary: and that, this being so, it is selfish, cruel, and tyrannical—tending, too, to increase selfishness, cruelty, and tyranny in men—to cut short the existence of the helpless inferior animals.

The opinion of physiologists is not favorable to V. The structure of man's organs is held to prove that nature intended him for an omnivorous animal—his stomach and intestines being fitted for deriving nourishment from every kind of food, and he being able, by means of cooking, to modify his food so as to prepare it for mastication and digestion. There is also almost a concurrence of medical experience against V., and in favor of the opinion that man, as regards all his powers and faculties, thrives best, and that —if a difference can be made out—he also lives longest, on a mixed diet. It has been found, in making railways, that differences between workmen in respect of bodily strength and energy were due chiefly to a difference of diet; that, for example, a beef-eating Englishman would do the work almost of three vegetable-fed Frenchmen, and that this difference of working-power disappeared when the Frenchmen took to eating beef. Upon the alleged beneficent moral influence of vegetable food, it has been observed that proof of its reality is lacking; moreover, that since the majority of mankind live either mostly or entirely on vegetables, vegetables must bear a large share of the responsibility which may fall upon diet for the evil tendencies of man; and that, in fact, the most cruel and the most debased of human races live entirely on vegetables. To the charge of cruelty brought against the practice of killing animals for food, it has been answered that the plan of nature contemplates such killing, and makes it impossible to avoid

it; that the microscope has shown us that even in taking a draught of water we may deprive a multitude of beings of life; and that, on the other hand, the system of rearing cattle for the butcher—since the cattle would otherwise not be reared at all—really adds largely to the sum of happy animal existence. It is not disputed that there is a liability to disease from the use of unwholesome meat; but, then, vegetables as well as animals are subject to diseases; and the reasoning which would drive us from the use of animal food because it may be diseased, would really cut us off from food altogether. There is probably, however, in countries where animal food is abundant, some tendency to make meat too large a portion of the diet. Moreover, different persons vary greatly in their requisite proportions of animal and vegetable food.

VEGETATE, v. *vĕj'ĕ-tāt* [mid. L. *vegetātus*, pp. of *vegetārĕ*, to arouse, invigorate—from L. *vĕgĕtus*, lively, vigorous—from *vegērĕ*, to quicken, to arouse; allied to *vigērĕ*, to flourish: F. *végéter;* It. *vegetare*, to grow, as plants]: to grow as plants; to sprout; to germinate; familiarly applied to persons, to live an idle, unthinking life. VEG'ETATING, imp. VEG'ETATED, pp. VEG'ETABLE, n. *-tă-bl* [F. *végétable*, vegetable—from L. *vegĕtābĭlis*, animating]: organized body destitute of sensation and voluntary motion, deriving its nourishment by means of roots from the earth (see VEGETABLE CHEMISTRY: VEGETABLE PHYSIOLOGY); a plant; especially an herbaceous plant used wholly or in part for the table, e.g., cabbage, cauliflower, turnips, carrots, potatoes, spinach, peas, celery, asparagus, etc.: ADJ. pertaining to plants; having the nature of plants; derived from vegetables. VEG'ETABIL'ITY, n. *-bĭl'ĭ-tĭ*, vegetable nature; the quality of growth without sensation. VEG'ETA'TION, n. *-tā'shŭn*, the process of growing, as seen in plants, by means of nourishment derived from the earth, air, or water; vegetables or plants in general; the living an idle life. VEG'ETATIVE, a. *-tā-tĭv*, growing, or having the power of growing, as plants; having the power of producing growth in plants. VEG'ETATIVENESS, n. *-nĕs*, the quality of being vegetative. VEG'ETA'RIAN, n. *-tā'rĭ-ăn*, one who abstains from the use of animal food as an article of diet; one who maintains that vegetable and farinaceous substances constitute the only proper food for man: ADJ. feeding upon vegetable food. VEG'ETA'RIANISM, n. *-ĭzm*, the theory and practice of living solely on vegetables. VEG'ETAL, a. *-ĕ-tăl*, pertaining to growth, existence, and reproduction in plants or animals: N. a plant or vegetable. VEG'ETIST, n. *-ĕ tĭst*, a vegetarian. VEG'ETOUS, a. *-ĕ-tŭs*, in *OE.*, active; frisky VEG'ETO-, a prefix, *-tō*, of or derived from vegetables or plants, as *vegeto-alkali*. VEGETABLE KINGDOM, one of the three great divisions of organic nature; plants—the other two being the *mineral* and *animal* kingdoms: see PLANT. VEGETABLE MARROW: see under MARROW 1: GOURD. VEGETABLE TISSUE, the substance of which plants consist. See CELLULAR TISSUE: VASCULAR TISSUE.

VEGLIA, *vĕl'yâ:* mountainous island, 23 m. long, 12 m. wide, in the Gulf of Quarnero, inlet of the Adriatic. It belongs to the govt. of Trieste, in the Austrian empire. The products are salt, marble, timber, wine, silk. There is one town, Veglia.—Pop. of island, about 16,000.

VEHEMENT, a. *vē'ĕ-mĕnt* [F. *véhément*—from L. *vehemens* and *vehemen'tem*, violent, impetuous—from *ve*, a negative particle, *mens* or *mentem*, mind = not very reasonable: It. *veemente*]: violent; very violent or forcible; very eager; very urgent; ardent; marked by great animation. VE'HEMENTLY, ad. *-lĭ.* VE'HEMENCE, n. *-mĕns*, or VE'HEMEN'CY, n. *-mĕn'sĭ*, great force; violent ardor; animated fervor; fury.

VEHICLE, n. *vē'ĭ-kl* [F. *véhicule*—from L. *vehicŭlum*, a carriage, a wagon—from *veho*, I carry or convey: It. *veiculo*]: any kind of carriage or conveyance; that which is used as the instr. of conveyance or communication; a medium; a solvent, in which varnish, paints, etc., are prepared for use; in *med.*, a substance in which medicine is taken. VE'HICLED, a. *-ĭ-kld*, conveyed in a vehicle. VEHICULAR, a. *vē-hĭk'ū-lér*, of or pertaining to a vehicle; also VEHIC'ULARY, a. *-ler-i*, and VEHIC'ULATORY, a. *-lătĕr-ĭ.* VEHIC'ULATE, v. *-lāt*, to convey, communicate, etc., as by a vehicle or medium.

VEHM'GERICHTE—VEHMIC COURTS: see FEMGERICHTE.

VEII, *vē'ĭ-ī:* ancient city of Etruria. Its site has been a matter of dispute, but it is now generally thought to be at *Isola Farnese*, about 12 m. from Rome. In very early times it was for more than 60 years a formidable rival of Rome—the struggle between the two cities having begun, it is said, as early as the time of Romulus, and continued under each of the kings, except the pacific Numa, down to its fall B.C. 396, after a siege of 10 years. It was forbidden to be again inhabited. In later times a colony was planted there by Cæsar, and again by Augustus; but it always remained an insignificant place. See ETRURIA.

VEIL, n. *vāl* [OF. *veile*, a veil—from L. *vēlum*, a covering, a curtain: It. *velo*, a veil]: a thin transparent cloth used by women to shade or conceal the face; that which is used for intercepting the view and hiding something; a curtain: V. to conceal; to cover; to hide. VEIL'ING, imp. VEILED, pp. *vāld.* TO TAKE THE VEIL, to enter a nunnery or cloister and become a nun, signified by covering the head with the head-dress of a nun.—The *Veil* is a very ancient article of dress. There is an allusion in Ovid to the wearing of veils by the Chinese, and Juvenal speaks of women as being so delicate as to be overheated by a silken veil. Though veils were generally considered portions of female dress, we read in the works of Ambrose, A.D. 374, of 'silken garments and veils interwoven with gold, with which the body of the rich man is encompassed.' Its use is now almost exclusively confined to women.

VEILED PROPH'ET, THE: see MOHAMMEDAN SECTS.

VEIN, n. *vān* [F. *veine*, a vein—from L. *vēna*, a blood-vessel: It. *vena*]: one of the vessels of the body which convey the blood back to the heart; in *bot.*, one of the small branching ribs of a leaf; in *geol.* or *mining*, fissures or rents traversing and ramifying through the solid rock of the earth's crust, filled with mineral or metallic matter, differing from the rock-mass in which it occurs; a streak or wave of a different color in marble, wood, etc.; tendency or turn of mind; humor; particular temper, as 'I'm not in the *vein*': V. to produce the appearance of veins in; to grain. VEIN'ING, imp.: N. the giving the appearance of veins to; a streaked appearance as if from the presence of veins. VEINED, pp. *vānd:* ADJ. streaked or marked, as some marbles, with lines or veins of color; having vessels branching over the surface, as a leaf. VEIN'LESS, a. *-lĕs*, having no veins. VEIN'LET, n. *-lĕt*, a small or auxiliary vein. VEIN'OUS, a. *-ŭs*, same as *venous*. VEIN'Y, a. *-ĭ*, full of or abounding in veins. VEINSTONE, the mineral matter found in a vein, in contradistinction to the metallic or metalliferous ores of which it forms the matrix; gangue. VEINSTUFF, the rock-matter which fills a vein, and through which the ore is disseminated in various forms.

VEINS, in Anatomy: the set of vessels which carry the return flow of blood from the various tissues and organs of the body to the heart or physiological centre; or, if we except the pulmonary, the portal, and the umbilical veins, the vessels which carry back venous blood from the capillaries, and, enlarging as they proceed, finally pour it through the ascending and descending *venæ cavæ* into the right auricle of the heart: see CIRCULATION. The coats of the V. are similar to those of the arteries, but much thinner, and even transparent. They are, however, of considerable strength. The *internal coat* consists of an epithelial layer, supported on several laminæ of longitudinal elastic fibres. The *middle* or *contractile coat* consists of numerous alternating layers of muscular and elastic fibres, the muscular fibres being disposed circularly round the vessel. The muscular fibres are absent in parts of the venous system, and specially developed in others (e.g., in the splenic and portal veins). In the *venæ cavæ* and the pulmonary V. near the heart, striped muscular fibres may be detected, continuous with those in the auricles. The *external* or *areolar fibrous coat* consists of connective or areolar tissue and of longitudinal elastic fibres; within some of the larger V., as the inferior *vena cava* through its whole length, the external iliacs, the azygos, etc., there is also a longitudinal network of unstriped muscular fibres. The V. contain a great number of valves, formed by a doubling of their lining membrane, which give free passage toward the heart, but prevent reflux of the blood: these valves are most numerous in the V. of the extremities, especially the lower ones, these vessels having to act against the force of gravity more than most others. They are absent in the *venæ cavæ*, the hepatic, portal, renal, pulmonary, and some other large V., and in very small V. generally. Like the arteries, the V. are nourished by nu-

trient vessels, or *vasa vasorum;* but except in a few instances (including the inferior *vena cava*), nerves are not distributed to them.

For the chief diseases of the venous system, see PHLEBITIS: PHLEBOLITE: PHLEGMASIA DOLENS, or MILK-LEG: THROMBUS: VARICOSE VEINS. Besides these may be mentioned *Hypertrophy* and *Atrophy*, two conditions of the venous system which must be regarded as the results of natural rather than of morbid action. Hypertrophy or excessive growth is a natural and healthy change, of which the following are illustrations. When the uterus enlarges during pregnancy, the quantity of blood in it increases in at least a corresponding ratio; so also are enlarged the venous canals by which it is removed; while shortly after delivery they return to their natural size, the hypertrophy being accompanied with a proportionate dilatation. This form of hypertrophy, with dilatation, often exerts a compensative action; one vein, or set of veins, taking additional work (consequently requiring increase of calibre), to make up for the partial or entire occlusion of another. When, e.g., the ascending *vena cava* is diminished in size, or even entirely and permanently closed, it is well known that the lower portion of the vessel dilates in common with the branches entering into it, and that the superficial abdominal veins or azygos, or both, become enlarged, and thus carry to the heart the blood which ought to have reached the heart by the usual course. If the obstruction is only temporary, the enlarged V. return to their original state, except that additional transverse fibres are found in the middle coat. Atrophy or wasting away of the V. accompanies the corresponding changes of other tissues when a part is permanently diseased. Amputation above the knee, e.g., soon reduces the femoral vein to less than one-third of its previous size.

VEINS, in Geology: crevices, more or less vertical, caused by the contraction during drying or metamorphoses, or by the mechanical disturbance of a rock, and which have been filled by materials different from the body of the rock, or with material drawn in solution from the adjacent rock, as most often occurs. V. containing substances that have been injected in a state of fusion from heat, or in a pasty condition, have had their origin in some internal force; while those filled with mineral deposits may or may not be connected with upheaval. Granitic and trappean V. differ from dikes chiefly in the greater size of the latter. They produce similar changes in the rocks which they penetrate, indurating clays and sandstones, and converting limestones into marble, or giving them a compact texture like hornstone. Granite V. (when due to pasty material forced up from underlying strata) are generally more sinuous in their course than those of trap; but when the granitic filling is drawn into the fissure from adjacent rock, usually gneiss, the vein may have the regularity of the rupture. One set of V. often intersects another, having been produced at a later period; and the two sets generally differ in color, grain, and even mineral

composition. Mineral V. may be filled with different kinds of crystalline minerals, and often in what is called a banded or combed arrangement, the several mineral deposits repeated inversely on the two sides, owing to the minerals successively in solution while the filling was in progress. Quartz and calcite are the most common of these substances: but frequently several different minerals occur in the same vein, some of these being metallic ores. V. of the same age are filled with the same metals, and usually maintain a general parallelism of direction: thus, the tin and copper V. of Cornwall run nearly e. and w.; while the lead veins run n. and s. Gash V. are due to the shrinkage of the rock, usually limestone, and are confined to the bed in which they occur. Fissure V. may pass through many beds of rock, and they result from deep rending, often extending over a wide area. Other so-called V. began in cavities or cracks enlarged by dissolution of the rock. Still others, spoken of in common language as V., are more or less upturned sedimentary strata. The filling of V. may be from material segregated from the adjoining rock, or deposits left by water from above, or injections or sublimations from below. Three kinds of V. are distinguished by miners—Rake, Pipe, and Flat veins. The rake V. are simple crevices, crossing all the rocks of a series, generally highly inclined, and apparently formed from the contraction of the rock. The two originally opposite surfaces may retain their relative positions, only separated by the interposed contents of the V.; or a fault may place the originally contiguous surfaces at different levels; and in such a case the intervening space between the walls of the vein is irregular, sometimes narrowing so that the walls are in contact, and then widening out, and forming large cavities containing ores. The pipe V. are irregular cavities, filled with minerals, and without any apparent connection with faults in the strata. Flat V. have a general direction corresponding with that of the stratification, and are connected sometimes with rake V., sometimes with pipe V. For the manner of working the minerals contained in veins, see MINING.

VEIT, *vīt* or *fīt*, PHILIPP: German painter: 1793, Feb. 13 —1877, Dec.; b. Berlin. His mother, daughter of Moses Mendelssohn, had for her second husband Friedrich Schlegel (q.v.), and V. became devotedly attached to the religious and artistic ideas of his step-father, whom he followed in his renunciation of Protestantism for Rom. Catholicism. After finishing his studies at Dresden, he went to Rome 1815, and became prominent in that coterie of young German painters who sought to infuse into modern art the purity and earnestness of mediæval times. Of all the associates, V. ventured furthest into the obscure realms of symbolism and allegory. His first famous work was the *Seven Years of Plenty*, executed as a companion-piece to Overbeck's *Seven Years of Dearth*, and reckoned one of the best works of the school to which it belongs. Other pictures of a high order painted during his residence at Rome are *The Triumph of Religion* (Vatican Gallery), Scenes from

Dante's *Paradiso* (Massimi Villa), and an altar-piece representing *Mary as Queen of Heaven* in the Trinità de' Monti. These procured him so great reputation that he was called to the directorship of the Städelsche Art Institute, in Frankfurt-on-the Main. There V. produced many grand pictures, of which the most celebrated is the large fresco (at the Institute) representing *Christianity bringing the Fine Arts to Germany*, deemed by many the finest fresco by any modern artist. In 1843 he removed to Sachsenhausen, in Hesse-Cassel. Among his later works are *The Ascension of the Virgin, The Good Samaritan,* and *The Egyptian Darkness.*

VELAZQUEZ, *vā-lâth'kĕth* (or VELASQUEZ, *vā-lâs'kĕth*), DIEGO RODRIGUEZ DE SILVA: famous Spanish painter: 1599, June 6—1660, Aug. 6; b. Seville; son of Rodriguez de Silva, a lawyer; descended from a noble family of Portuguese origin. His mother's name was Velazquez, and by that he was known. He was sent to be educated in the studio of Francisco Herrera el Viejo, an artist of considerable force and originality. He afterward became the pupil of Francisco Pacheco, a man accomplished in theory, but who could teach him little that was practical. The old pedant had, however, an attractive daughter, Juana, who, doubtless, to the eyes of the young painter, atoned for her parent's deficiencies, and who married him at the end of five years. His chief education, however, as with all men of real genius, was that which he gave himself; he painted assiduously from the life; his models were mostly of the sordid peasant class; and the influence of these seems traceable in some lack of that elevation of ideals needed to ennoble his superb realistic hardihood of manner. In 1622 he visited Madrid, to study its artistic treasures. During his stay he painted the portrait of the poet Gongora, and made some influential friends, at whose instance he was, 1623, invited to return by Duque de Olivarez, favorite of Philip IV. His portrait of this magnate so delighted the king that he himself sat to the artist, and the result was a picture of great merit, which made V. famous. The office of court painter was bestowed on him, and he embarked on a full tide of prosperity which continued through life. Of Philip IV. and his family he painted many pictures, and a portrait—unfortunately lost—of Charles I. of England, then (1623) at Madrid. The year 1628 was made memorable to him by the arrival, in Madrid, of the great Rubens, on a diplomatic mission. The two artists soon became friends; but though Rubens, during his stay, was assiduous in the practice of his art, V.'s style, now matured, was entirely uninfluenced by his florid harmonies of color and riot of animal vigor.

V. had long desired to visit Italy; and permission was granted him 1629. Everywhere he was received with highest honors: in Rome, Pope Urban VIII. assigned him apartments in the Vatican. Here he employed himself chiefly in copying the frescoes of Raphael and Michael Angelo; and it is remarkable that in his one or two original pictures of this time there is no trace of his having been

influenced by his studies of these mighty masters. He was not insensible of their power; though he has left it on record that of all the Italians he considered Titian the greatest. Having recovered from a severe illness, he proceeded to Naples; and finally, in the spring of 1631, returned to a cordial welcome at Madrid. He had a painting-room in the palace; and the king was wont to watch him at work. It illustrates a noble trait in the man that when, 1643, the Duque de Olivarez, to whom he had been indebted while obscure, incurred disgrace at the hands of Philip, V. braved the royal displeasure by continuing to show him in everything the accustomed respect. In 1648 V. was sent to Italy, to buy pictures and other works of art for the king. He returned to Madrid 1651; after which many of his finest works were painted. In 1656 the cross of Santiago was conferred on him by Philip—an honor never before awarded except to the highest nobility; also, he was appointed Aposentador Mayor. This high office, whose duties consisted in attendance on the king for superintendence of the quarters occupied by the court at home or on journeys, was one of much honor and emolument; but it involved at times great trouble and anxiety; and on the specially important occasion of the conferences, 1660, to arrange the marriage between Louis XIV. and the Infanta, these were such as utterly to prostrate the painter. July 31 of that year, he returned to Madrid, worn out with overwork, and died a week later. He was buried with much ceremonial in the Church of San Juan. His wife, who was passionately attached to him, survived his loss about a fortnight.

V.—with the exception, perhaps, of Murillo—takes admitted rank as the greatest of Spanish painters. His portraits are, for force, penetration, directness, and severity of truth, of almost unrivalled merit; his historical pictures also are of rare value; his landscape-effects are full of air and light; and his treatment of religious subjects lacks only that deeper spirituality whose expression has been in its fulness attained by none except a few of the earlier Italians. V. did not form a school in art: his style was too individual, his genius too original. His works in Britain and the United States are few: an adequate conception of his style can be formed only at Madrid. See Sir W. Stirling-Maxwell's *V. and His Works* (1855); Stowe's *Velazquez* (1880).

VELD, n. *fĕlt*, or VELDT [Dut. *veld*, a field]: in *s. Africa*, the unforested or sparsely forested region; the grass-country. BUSHVELD, thorns or lowlands; low-wooded lands. HIGHVELD, plains above the altitude of thorns. LOWVELD, n. *lû-fĕlt'*, thornveld; the level where thorns grow, below the great plateau. THORNVELD, n. lowveld.

VELEZ-MALAGA, *vā'lĕth-mâ'lâ-gá:* town of s. Spain, in the mod. prov. of Malaga; 15 m. e.n.e. of the city of Malaga, and less than 2 m. from the shore of the Mediterranean. It stands at the foot of a hill which forms part of the s. range of the Sierra Tejada. The climate is delightful; and owing to the abundance of moisture supplied by the

hill-streams from the n., and the heat of an almost tropical sun, the vegetation is luxuriant. The aloe, palm, sugar-cane, prickly-pear, orange, vine, olive, indigo, and sweet potato (*Batata de Malaga*), grow here abundantly. There are here the ruins of a Moorish castle, with a small tower. The town was taken from the Moors by Ferdinand the Catholic 1487, after a long siege.—Pop. (1884) 24,711.

VELIKI-LOUKI, *vā'lē-kē-lō'kē:* town of Great Russia, govt. of Pskov; on the river Lovat, 130 m. n.w. of Smolensk. It is one of the most ancient towns of Russia, having belonged to Novgorod before the annexation of that territory to Moscow. Boots are largely manufactured, and exported to St. Petersburg.—Pop. (1880) 5,921.

VELIKI-USTIUG, *vā'lē-kē-ôs-tē-ôg'*, or USTIUG'-VE'LIKI: trading town of Great Russia, govt. of Vologda; at the confluence of the Jug and the Suchona, 350 m. s.e. of Archangel. It was founded in the 13th c. by a colony from Novgorod. Among the industries is the manufacture of small ironware and of linen.—Pop. (1881) 17,976.

VELI'NO, CATARACT OF: see TERNI.

VELLEIA, *vĕl-lā'yâ*, or VELEIA, *vā-lā'yâ:* town of anc. Liguria, on the n. slope of the Apennines, 18 m. s.-by-e. of Placentia (Piacenza). Little information respecting it can be gleaned from the Latin writers. The Veleiates are mentioned by Pliny among the Ligurian tribes, and seem to have been subjected to Rome B.C. 158. The town, however, dates from the time of Tiberius, and appears, from the traditionary account, to have been overwhelmed by a land-slip of the mountains Moria and Rovinazzo, the earth having been loosened by percolation through it of the waters from a lake high up in the mountains. A comparison of the soil which covers the city with that of the mountains confirms this story. V. remained hid and forgotten till 1747, except that for about a century it had been known to a very few that ancient treasures were buried here, and gold statues and coins had been found. In 1747 a field-laborer turned up a tablet of bronze, on which Trajan's alimentary law for the public maintenance of 279 children was written. This tablet, which measured about 8 ft. 8 inches by 5 ft. 9 inches, Paris measurement, and weighed 7,200 ounces, narrowly escaped being melted down for bell-metal. Excavations begun 1760 by order of the Duke of Parma, and continued till 1765, resulted in discovery of a forum, in which was another but smaller bronze tablet, an amphitheatre, baths, 12 marble statues, numerous small bronze statues, medals, coins, stamps, inscriptions, and bronze instruments. None of the coins found bear later date than the time of Probus, 276–282; hence it has been supposed that the catastrophe which overwhelmed the city happened during or soon after his reign. The museum at Parma contains most of the antiquities from V.—See *La Rovina di Veleia, misurate e disegnate da Giovanni Antolini*, etc. (Milano 1819); and *Tavola Legislativa della Gallia Cisalpina ritrovata in Veleia, da D. Pietro di Lama* (Parma 1820).

VELLET, n. *vĕl'lĕt* [see VELVET]: in *OE.*, velvet; also VEL'LUTE, n. *-lūt.*

VELLETRI, *vĕl-lā'trē:* city of s. Italy, prov. of Rome, 21 m. s.e. of Rome; on a hill, a spur of Monte Artemisio. The city is walled and well-built. The principal buildings are the cathedral, an anc. Gothic structure; and the Ginetti Palace, with a marble staircase, considered the finest in Italy. The hill of V., which, like the surface of all the country between it and Rome, shows evidence of volcanic action, produces good wines. Pop. (1881) 13,532.

VELLON': Spanish for BILLON (q.v.).

VELLORE, *vĕl-lōr':* town and fortress of Brit. India, 79 m. w. of Madras, on the right bank of the Palar. The fort is extensive, is surrounded by a ditch cut in the solid rock, and contains barracks, hospitals, etc. The town is large, clean, and airy, and has an extensive and well-supplied bazaar. There is a remarkable and splendid pagoda, dedicated to Krishna, whose adventures with the *gopis*, or milkmaids, are represented in a series of elaborate sculptures. Although the heat of V. is great, it is considered one of the most healthful stations in the Carnatic. Pop. (1881) 37,491.

VELLOZIA, *vĕl-lō'zĭ-a:* genus of plants, of nat. order *Hæmodoraceæ*, natives of Brazil, s. Guiana, and the Mascarene Islands; sometimes called *Tree Lilies.* They are perennials, with trunks closely covered by the withered remains of leaves, branching by forks, and bearing tufts of long, narrow, aloe-like leaves at the extremities of the branches. Some are from 2 to 10 ft. high, and the trunk is sometimes as thick as a man's body. The structure of the trunk is very remarkable: it has a slender sub-cylindrical central column, of the ordinary monocotyledonous structure, outside of which are arranged great quantities of slender fibrous roots, which cohere firmly by their own cellular surface, and form a spurious kind of wood. In some s. districts of Brazil, vellozias are found covering large tracts. The flowers of the larger species are about six inches long, either pure white, or of beautiful purple color, and resembling the white lily of our gardens.

VELLUM, n. *vĕl'lŭm* [F. *vélin*, vellum—from L. *vitŭlīnus*, of or pertaining to a calf—from *vitŭlus*, a calf]: a fine kind of parchment prepared from the skins of calves, kids, and lambs, and used for writing on (see PARCHMENT). VEL'LUMY, a. having a surface resembling that of vellum.

VELLUS, n. *vĕl'lŭs* [L. *vellus*, a fleece]: in *bot.*, the stipe of some fungi.

VELOCIPEDE, n. *vĕ-lŏs'ĭ-pēd* [F. *vélocipède*, a velocipede—from L. *velox* or *velōcem*, swift; *pes* or *pedem*, a foot]: a light carriage with two (or three) wheels, propelled by the rider by means of a treadle; with two wheels it is called a BICYCLE, *bī'sĭk-l* [L. *bis*, twice; Gr. *kuklos*, a circle], and with three wheels a TRICYCLE, *trī'sĭ-kl* [L. *tres*, three]: see BICYCLE: TRICYCLE. VELOC'IPE'DIST, n. *-lŏs'ĭ-pē'dĭst*, one who rides on a velocipede.

VELOCITY, n. *vĕ-lŏs'ĭ-tĭ* [F. *vélocité*—from L. *velocitas* or *velocĭtātem*, speed—from *velox* or *velōcem*, swift: It. *velocità*]: quickness of motion; rapidity; rate of motion (see below).—SYN.: quickness; celerity; expedition; swiftness; fleetness; speed.

VELOC'ITY: speed, or *rate of motion*. For its proper measurement, we must distinguish between uniform and varying velocity.

Uniform velocity is easily measured by *the space passed over in a unit of time:* thus, we speak of velocities of 10 ft. per second, 20 m. per hour, etc. But, for scientific purposes, it is best to keep, as far as possible, to definite units of time and space; and those most generally convenient are the *second* and the *foot*. The *foot* is definitely known; the *second* is usually chosen as the interval between the beats of a good mean-time clock. Unfortunately, its duration is not invariable; but, as ages must elapse before any sensible alteration takes place in its length, it may be used without inconvenience. If, then, v be the velocity of a point moving uniformly, we mean that v feet are passed over in each second; so that if s represent the space passed over in t seconds, we have

$$s = vt,$$

a formula which contains all the properties of uniform motion. It gives

$$v = \frac{s}{t};$$

i.e., to find the velocity of a moving point (when uniform), divide the space (in ft.) described in *any* period of time by the number of seconds in the period. This will give the same result whether we take a million seconds or the millionth part of a second, as the period in question. This at once shows us how to proceed in measuring a variable velocity, such as that of a stone let fall, in which case the velocity constantly increases, or of a stone thrown upward, in which case the velocity constantly diminishes.

That a moving body has, at every instant, however irregular its motion may be, a definite velocity, is obvious. Thus, when travelling in a railroad train, we say, shortly after starting: 'We are now going at the rate of a mile an hour;' not thereby meaning that it will take us an hour to complete the mile, but that, *if we were to go on for an hour at our present rate of velocity, we should run a mile.* In common language, then, our question is, how to measure our present rate.

If we could at any instant so adjust the steam-power to the resistance of the air and the friction of the rails as to keep the rate unaltered, we should have uniform velocity, measurable with ease. But, as we cannot generally do this (though Attwood's machine enables us to do it in the case of a falling body), we are driven to some other expedient. Now, it is obvious that the smaller the interval that we take, the less will our velocity have changed during its lapse, i.e., the more nearly will it have become uniform

and measurable by the simple formula given above. That is, for a variable velocity we have

$$v = \frac{s}{t}$$

as an approximation, which is more and more nearly true as t, and therefore s, is smaller. In the language of the differential calculus—whose fundamental notions, as laid down by its great inventor, were derived from this very question, the velocity being simply the *Fluxion* (q.v.) of the space described—we have

$$v = \frac{ds}{dt}.$$

Practically, by means of the electric chronoscope, we can now measure (very exactly) extremely small intervals of time, e.g., the interval between the fall of the dog-head and the exit of the bullet from a rifle-barrel; so that a variable velocity now presents no formidable difficulty, as we can study and measure it *while it is almost absolutely uniform.*

We define *average* velocity as the space described in any time divided by the number of seconds employed. This may not, except at one or more instants during the motion, represent the actual velocity; but it is a velocity with which, if uniform, the same space would have been described in the same time. We shall presently have an opportunity of usefully applying this definition to one interesting case of varying velocity.

The *resolution* and *composition* of simultaneous velocities follow, almost intuitively, from the most elementary geometrical notions. When a man is walking n.e. at uniform rate, it is obvious that he is advancing northward, and also eastward. What is his northward, and what his eastward velocity? The answer is simple. Suppose that in one second he walks from A to B, then AB represents his whole velocity. But draw AN northward, and AE eastward; also draw BC parallel to AN. Then AC is the space by which B is eastward of A, BC the space by which it is northward. Hence AC represents the eastward, and CB the northward velocity (each being the space in its respective direction described in one second), and these are called *components* of the velocity AB. AB, again, is said to be *resolved* into AC and CB.

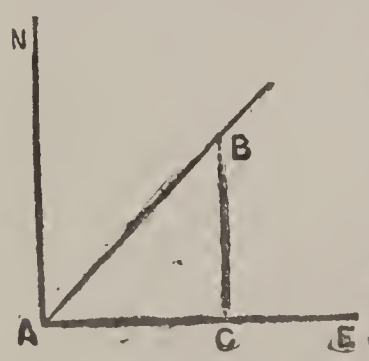


Fig. 1.

The general proposition is this, that a velocity represented by one side of a triangle may be resolved into two, represented in magnitude and direction by the other sides of the triangle. One or both of these may be again resolved by a similar process; and we find, as the most general propositions on the subject, that velocities represented by all the sides of a polygon (whether in one plane or not) but one, taken in the same order round, are jointly equivalent

to a velocity represented by that one side, taken in the *opposite* order; also that a point which has, simultaneously, velocities represented by the sucessive sides of any polygon, taken all in the same order round, *is at rest.* The second law of motion (see MOTION, LAWS OF) enables us to interpret this geometrical theorem into the Physical Truths known as the Triangle and Polygon Forces in Statics.

Rate of change of velocity is called *Acceleration:* it is measured in the same way as velocity itself. Thus, if the change take place in the direction of motion, it affects merely the amount, not the direction, of the velocity; and an acceleration α adds (or subtracts if it be negative) α feet per second from the velocity affected. Thus it is found that gravity produces an acceleration of about 32·2 on all falling bodies; so that if a stone be let fall, its velocity after t seconds is $32{\cdot}2t$. If it be *thrown* down with a velocity v, its velocity in t seconds is $v + 32.2t$. If thrown upward with the same velocity, in t seconds its velocity becomes $v - 32{\cdot}2t$, so that it will stop and begin to descend after $\frac{v}{32{\cdot}2}$ seconds have elapsed.

The space passed over by the stone in t seconds is easily calculated by the help of the *average* velocity. For, since in any of the above cases the velocity increases (or diminishes) *uniformly*, its average value during any interval is the average of its values at the beginning and end of the interval. Hence, for the stone simply let fall:

Initial velocity $= 0$,

Velocity after t seconds $= 32{\cdot}2t$,

Average velocity during the first t seconds $= 16{\cdot}1t$,

Hence, space described in t seconds

$$= t \times \text{average velocity} = 16{\cdot}1t^2.$$

Thus the spaces described are as the *squares* of the times.

But, if the acceleration be not in the direction of motion, the direction and magnitude of the velocity will generally change. To exhibit this geometrically, Sir W. Rowan Hamilton (q.v.) invented the following beautiful construction of what he called the Hodograph of the motion. Let O be any fixed point, and from it draw lines OP, OQ, etc., representing, at every instant, in direction and magnitude the velocity of the moving point. The extremities of such lines will form a curve, such as PQ in the figure. If OP and OQ be any two of these, the *change* of velocity is represented (as above) by the third side, PQ, of the triangle. As Q is taken nearer and nearer to P, PQ becomes more and more nearly the tangent to the hodograph, so that the tangent at P has the *direction* of the acceleration, and the rate at which P moves round the hodograph is the *magnitude* of the acceleration.

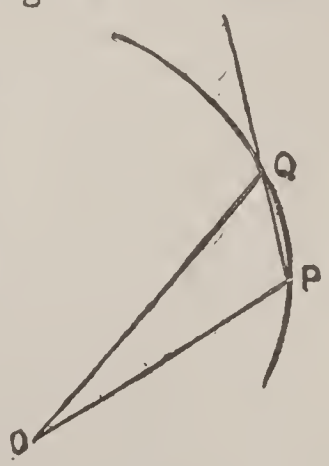


Fig. 2.

If we consider any uniform motion, we see that the

hodograph is a circle (its radius being the magnitude of the velocity), and from this it is easy to see that *in uniform motion the acceleration is always perpendicular to the direction of motion.* If we consider uniform motion, with velocity V, in a circle of radius R, the hodograph at once shows that the acceleration is $\frac{V^2}{R}$, and is directed toward the centre of the circle.

Translated into Physics, acceleration (multiplied by the mass of the moving body) is the measure of the force which acts on the body. So the above simple example shows that, to keep a mass moving uniformly in a circle, it must be drawn toward the centre by a force proportional directly to the square of the velocity, and inversely to the radius. This is the physical explanation of the so-called Centrifugal Force (see CENTRAL FORCES).

VELOCITY, INITIAL, in Gunnery: speed with which the ball leaves the muzzle of a gun when fired. This was formerly calculated from the momentum as shown by the Ballistic Pendulum (q.v.); but better results have been obtained from the use of the Electro-ballistic Pendulum, of Major Navez of the Belgian service, which actually measures the interval of time during which the shot traverses a short space. The apparatus consists of a steel pendulum falling at the side of a graduated sector of a circle. Behind the segment is a piece of iron capable of being magnetized by a galvanic battery adjoining. The wires for completing the circuit between the battery and the magnet are so arranged that they are in connection with two targets of paper or other thin material in the line of the projectile's fire. So long as the circuit is complete, and before the experiment, the magnet holds the pendulum at its highest point. When the shot pierces the first target, the circuit is broken, the iron demagnetized, and the pendulum released; these effects being absolutely simultaneous. With equal simultaneity, the piercing the second target re-establishes the circuit, magnetizes the iron, and arrests the pendulum in its descent. The distance between the targets is known, and the accumulating resistance of the atmosphere within that time; the sector being finely graduated, the distance traversed by the pendulum shows exactly the fraction of a second occupied, and from these data the initial velocity is a matter of simple computation. Of smooth-bore cannon, the initial velocity is about 1,600 ft. per second; of the great breech-loading rifle (1891), more than 2,000 ft. per second.

VELOCITY, VIRTUAL: see WORK.

VELOURS, n. *vė-lôr'* [F., velvet]: fabric for upholstering, etc.; a velvet or plush, partly of linen and partly of double cotton warps, with mohair-yarn weft.

VELPEAU, *vĕl-pō'*, ALFRED ARMAND LOUIS MARIE: surgeon: 1795, May 18—1867, Aug. 24; b. Brèche, France. His father was a horse-doctor, and V. early was interested in medicine. He began the study of med. in Tours 1816, settled in Paris 1821, became surgeon at la Pitié 1830, prof.

of clinical surgery in the Acad. of Med. 1835, and at the Institute 1842. He ranks among the foremost surgeons of modern times. His published works are numerous; his *Leçons Orales de Clinique Chirurgicale* were pub. 1840-1 by two of his pupils.

VELUM, n. *vē'lŭm* [L. *vēlum*, a covering, a veil]: in *bot.*, the cellular covering of the gills of an agaric in its early state; in *zool.*, the membranous ledge which surrounds the mouth of the disk of the Medusæ.

VELURE, n. *vĕl'ūr* [F. *velours;* OF. *velous*, velvet—from L. *villōsus*, hairy (see VELVET)]: in *OE.*, velvet.

VELUTINOUS, a. *vĕl-ū'tĭ-nŭs* [a manufactured word (see VELVET)]: in *bot.*, having a velvety appearance; feeling like velvet.

VELVET, n. *vĕl'vĕt* [OE. *velwet, velouet, vellet*—from O. It. *veluto;* It. *velluto*, velvet—from L. *villus*, shaggy hair, allied to *vellus*, a fleece]: a rich closely-woven silk stuff having on one side a fine soft pile; a similar fabric made of cotton, also called velveteen; the fine down on the horns of a deer during their early development: ADJ. made of velvet; soft; delicate. VEL'VETY, a. *-ĭ*, resembling velvet; soft, smooth, or delicate. VEL'VETING, n. velvet goods; the soft pile of velvet. VEL'VETEEN', n. *-ēn'*, a stuff made of twilled cotton in imitation of velvet. VELVERET, n. *vĕl-vĕr-ĕt'*, an inferior sort of velvet having the pile of silk and the web of cotton. VELVET-GUARDS, in *OE.*, velvet trimmings; hence, the citizens who wore them.—*Velvet* is properly a silk fabric with thick short pile on one side; but cotton velvets also are made. In velvet-weaving two warps are used—the ordinary 'beam warp,' and a much finer and longer one called the 'pole' or 'pile' warp, which at every third pick or throw of the shuttle is caught in loops on a grooved wire, which is then introduced into the shed, and beaten up into the cloth. The rows of loops thus formed on the surface are afterward cut by running a 'trivet' or cutting-knife along the groove in the wires which are thus released.

VENAL, a. *vē'năl* [F. *vénal*—from L. *venālĭs*, for sale, to be sold—from *vēnus*, sale: It. *venale*]: that may be purchased or bribed; ready to sell one's services, influence, etc., for money, as a *venal* politician; mercenary; hireling; corrupt; made a matter of sordid bargaining, as a *venal* offense. VENALLY, ad. *-lĭ*. VENALITY, n. *vē-năl'ĭ-tĭ*, state of being influenced by money or by a bribe; prostitution of talents or services for money or reward.

VENAL, a. *vē'năl* [L. *vēna*, a vein]: venous.

VENA PORTA, n. *vē'nă pōr'tă* [L. *vēna*, a vein; *Porta*, the name of an Italian anatomist]: in *anat.*, the large vein which conveys the blood from the intestines into the liver. VENÆ CAVÆ, n. *vē'nē kăv'ē* [L., the hollow veins]: the large veins which pour the blood collected from the body into the heart: see CIRCULATION.

VENARY, a. *vĕn'ă-rĭ* [L. *venārĭ*, to hunt, to chase]: in *OE.*, of or pertaining to hunting or the chase.

VENATION, n. *vē-nā'shŭn* [L. *vēna*, a vein]: the arrangement of the veins, as in a leaf, the wings of an insect, or the like.

VEND, v. *vĕnd* [F. *vendre*, to sell—from L. *vendĕrĕ*, to sell, to give up a thing for money—from *vēnum*, sale; *do*, I give: It. *vendere*]: to sell; to give or transfer to another for money, as articles of merchandise. VEND'ING, imp. VEND'ED, pp. VEND'ER, or VEND'OR, n. *-ĕr*, a seller. VENDEE, n. *vĕn-dē'*, the person to whom a thing is sold. VEND'IBLE, a. *-ĭ-bl*, salable; that may or can be sold. VEND'IBLY, ad. *-blĭ*. VEND'IBLENESS, n. *-bl-nĕs*, or VEND'IBIL'ITY, n. *-bĭl'-ĭ-tĭ*, state of being salable. VENDITION, n. *vĕn-dĭsh'ŭn*, sale; the act of selling.

VENDACE, n. *vĕn'dās* [F. *vandoise*]: a fish of the family Salmonidæ, *Coregonus Willughbii* (or *marænula*), found in the rivers and lakes of Sweden, in the Castle Loch at Lochmaben in Scotland, and in some English lakes (see COREGONUS). Like most of its congeners, it is esteemed for the table. Its food consists chiefly of *Entomostraca*, and it is never taken by angling. Sweep-nets are used for its capture. It swims usually in considerable shoals, often with a remarkable separation of the sexes. It attains a length of 6 or 7 inches, is deeper in proportion than many of the Salmonidæ, and of compressed form. The back is brown, sides are tinged with yellow, cheeks partly white, and there is a curious, red, heart-shaped mark between the eyes.

VENDÉE, LA, *lâ vŏng-dā'*: maritime dept. in w. France; bounded w. by the Bay of Biscay, n. by the dept. of Loire-Inférieure, e. by Deux-Sèvres, s. by Charente-Inférieure; 2,587 sq. m. The dept., named from a small affluent of the Charente, is traversed from e. to w. by a range of hills, called in the e. the Plateau de Gatin, and in the w. the Collines Nantaises; and is watered in the n. by affluents of the Loire, and in the s. by the Lay and the affluents of the Charente. The territory of La V. is divided into three parts, whose names indicate their configuration. In the w. is the *Marais*, occupied by salt marshes and lakes; in the n. is the *Bocage*, covered with plantations; in the s. and middle is the *Plaine*, an open and fertile tract. The Atlantic coast of 93 m. presents few deep indentations, the chief being the Bay of Aiguillon, which affords secure anchorage. The climate is warm, humid, and unhealthful in the *Marais*, cold and humid in the *Bocage*, and warm, dry, and healthful in the *Plaine*. Cereals, potatoes, and vegetables are largely cultivated; the wine produced, which is white and of inferior quality, amounted (1881) to about 15½ million gallons. Among the mineral treasures, iron ore is very abundant. There are three arrondissements—La Roche-sur-Yon, Fontenay-le-Comte, and Sables-d'Olonne, cap. La Roche-sur-Yon. Pop. (1886) 434,808; (1901) 441,311.

For the *wars of La V.* (by which name the armed opposition to the religious and political changes in France is denoted, and which burst out into a species of partizan warfare in 1793, 4–5, 1799, and 1815), see CATHELINEAU: LA ROCHEJACQUELEIN: HOCHE: CHOUANS: ETC.

VENDÉMIAIRE, *vŏng-dā-mĭ-ăr'* ['Wine-month']: first month of the French revolutionary calendar, beginning Sep. 22 and ending Oct. 21 (1793): see CALENDAR.

VENDETTA, *vĕn-dĕt tâ:* blood-feud; the practice of taking private vengeance on those who have shed the blood of a relative—a practice which prevails especially in Corsica, and to a limited extent in Sicily, Sardinia, Calabria, etc., and in some s. and s.w. parts of the United States. In Corsica it is considered a duty incumbent on every one; and should the murderer succeed in eluding the pursuit of the murdered man's kinsmen, revenge may be taken on the murderer's relatives. Hence, in Corsica, the relatives of a murderer whose crime is unavenged have to live in a state of incessant precaution. When they go to the fields, they take their arms with them, and set a watch; at home, they have their doors well fastened, and their windows barricaded. Instances are on record of persons 'suffering the vendetta' having lived shut up in their houses for 10 or 15 years, and being, after all, shot on the first occasion on which they ventured out of doors. Formerly, when blood had been shed, there was a custom (now disused) of proclaiming a war of revenge, and announcing to what degree of relationship it should extend. The duty of taking vengeance lies primarily on the next of kin. Not to take revenge is deemed in the highest degree dishonorable; and any delay by the next of kin is made matter of reproach by his relatives. The women instigate the men to revenge.

The origin of the V. has often been referred to the lawlessness which prevailed in many parts of Corsica during the Genoese domination, and to the venality which vitiated the Genoese administration of justice. No doubt this has had something to do with it; but its origin must be sought in more general causes, for it is not exclusively a Corsican custom. A system of private vengeance has existed among almost every people during certain stages of its progress—never entirely passing away until government became strong enough to insure redress of injuries, and to restrain the passions of individuals. The incidents of the V. among rude tribes are usually the same which Sir G. Grey found subsisting among the aborigines of Australia, vividly described in his *Journals of Travel in the Northwest of Australia.*

Of the prevalence of the blood-feud among tribes which have advanced to what is called the patriarchal state also there is ample evidence. Among such tribes the cohesion of the family is very powerful; everything relating to the family is quasi-sacred; and the duty of taking vengeance for kindred blood is a matter not merely of honor, but also of religion. Among the Bedouins it is called *Tar*, or retaliation; and the right of exacting it devolves on the nearest of kin to the man slain; and if the proposed victim perishes from any other cause, then the vengeance is directed against his nearest relative. The V. is observed among the Circassians, the Druses, and the numerous hordes of central Asia; it seems to have had the same incidents, too, among similar tribes in ancient times—e.g.,

among the Greeks of the Homeric period, among the Germans in the time of Tacitus, among the northern nations who overran Europe after the fall of the Roman empire.

The right of private war which subsisted in Europe in the middle ages—introduced by the northern nations who shared the spoils of the Roman empire—belonged to the nobility only, and could be exercised only against men of equal rank. It was usually resorted to on account of insults publicly done, of atrocious acts of violence or bloodshed, and similar injuries. The right of vengeance devolved first on the next of kin; but all the kindred within the degrees of relationship to which the ecclesiastical prohibitions of marriage extended were bound to take up the quarrel; and this obligation was so far sanctioned by law that if any one failed to fulfil it he was deemed to have renounced his kindredship, and to have lost his rights of succession. Previous to the consolidation of society, this system was a rude substitute for protection by government and for administration of justice. As society became organized, the right of V. was curtailed—remaining longest with the nobility, who at last were compelled to surrender it by the growing power of the state.

VENDÔME, *vŏng-dōm':* town of France, dept. of Loir-et-Cher; on the Loir, which here divides into many canals; 45 m. w.s.w. of Orleans, 109 m. s.w. of Paris. It contains cavalry barracks; a theatre; the Church of the Trinity, a remarkable edifice (founded 1030); one of the most beautiful colleges of France; and the ruins of a lofty castle. Manufactures of cloths, needles, and embroideries are actively carried on.—Pop. (1886) 7,843.

V., a very anc. town, and said to have been of importance under the Merovingians, was cap. of the anc county of Vendomois, which was erected into a duchy-peerage by Francis I., in favor of Charles de Bourbon, the grandfather of Henry IV., who conferred it on Cæsar, the eldest of his natural sons, who thus became the founder of the House of V. In 1870 it was the scene of several conflicts between the French and Germans.

VENDÔME' (Louis Joseph), Duke of: French general, who distinguished himself during the war of the Spanish succession (see Succession Wars): 1654, July 1—1712, June 11; b. Paris; eldest son of Louis, Duke of V., and Laura Mancini, niece of Mazarin; and great-grandson of Henry IV. V. made his first appearance on the field of battle as a lifeguardsman during the Dutch campaign of 1672, afterward serving with distinction under Turenne in Germany and Alsace, and under Crequi in Flanders. Released by the peace of Nimeguen (1678), he retired to his chateau of Anet, near Dreux, where he resigned himself to indulgence in all kinds of pleasure. At this time he became compromised in the affair of Lavoisin (see Poisoning); but it turned out that his intercourse with the pretended seer was prompted merely by curiosity. On the outbreak of war in 1688, he was ordered to the Low Countries, where, under Luxembourg (q.v.), he earned renown at the sieges of Mons and Na-

mur, and the battles of Leuse and Steenkerke; and his reputation was not diminished by his subsequent conduct in Italy, where he commanded the left wing of Catinat's army at the battle of Marsaglia, 1693, Oct. 4. But V.'s gallantry and brilliant military talents had not hitherto obtained for him an independent command, for it was evident that with these valuable qualities were combined inveterate indolence and careless and disorderly habits, which might bring ruin to any enterprise under his management. However, the necessities of the case induced Louis ultimately to give him (1695) command of the army in Catalonia; and he was agreeably surprised at the alertness of V., who closed a series of brilliant successes by the capture of Barcelona. After five years of inaction, spent in sloth and sensuality, V. was ordered to Italy to supersede Villeroy. His arrival was hailed enthusiastically. The restored confidence of the troops was proved by the victories of Ustiano and San Vittorio; while the enforced retirement of Prince Eugene beyond the Mincio showed the superior strategic abilities of their general; and it required the utmost exercise of both to prevent the surprise at Luzzara, 1702, Aug. 17 (the result of V.'s usual carelessness), from becoming a total rout. From this time a slight though temporary improvement in V.'s habits is noticeable. In 1703 he drove the Austrians into the Tyrol, repeatedly defeating Starhemberg. Eugene was advancing to the relief of Turin, when the defeat of his advance-guard by V. compelled a halt. The imprudent Frenchman, however, intrusted to his younger brother the difficult duty of holding Eugene in check; and had not V. returned to Cassano just in time to divide the honors of the battle-field with his opponent, the army of observation would have been scattered. Again, partially stimulated by this narrow escape, V. displayed unwonted vigor, and drove the Austrians into the Trentin; but in the summer of 1706 he was recalled to supersede Villeroy, who had blundered in the Low Countries, as he had formerly blundered in Italy. Unfortunately an attempt was made to counteract V.'s besetting faults by uniting the Duke of Burgundy with him in command; and the lack of a thorough understanding between the conjoint chiefs lead to the defeat of the French at Oudenarde (q.v.), and to the failure of the attempt to relieve Lille. The cause of these reverses formed the subject of vehement discussions in France. Though V. was mostly to blame, his great reputation gained him the public support; but Louis XIV. held him in a sort of disgrace for a time. In 1710 a cry of distress arose from Spain, where the British and Austrians were carrying all before them; and in compliance with the urgent request of Philip V. (who had served under V. in Italy) to his grandfather to send him, not a reinforcement, but only V., the heroic old debauchee was once more called to active service, and dispatched to Spain. His appearance, like that of Du Guesclin more than three centuries before, brought together, as if by magic, a numerous army of volunteers; towns, villages, and even

religious establishments united in enthusiastic contribution of the necessary funds, and Philip was settled in his capital before the close of the year. A week later, Stanhope and the Brit. troops were defeated and captured at Brihuega; and on the following day, Starhemberg and the Austrians were completely routed at Villa Viciosa. The grateful monarch raised his deliverer to the rank of 'prince of the blood-royal,' and presented him with 500,000 livres (about $100,000), a gift which V. accepted only to distribute it among his soldiers. V. for the last time relapsed into his former habits, and, after 'a month of extraordinary gluttony,' died of indigestion at Vinaroz, in Valencia. Of all the descendants of Henry IV., V. bears the strongest resemblance to his great-grandfather; but of his resolute persistency and self-denial he shows no trace.—See Saint-Simon's biography of V., and Voltaire's *Siècle de Louis XIV.*

VENDOR'S LIEN, *vĕnd'ėrz lēn:* right of one who sells land, giving a deed which declares that the purchase-money has been paid (though in fact it has not all been paid), to recover what remains due out of the proceeds of a resale: this lien stands till all the purchase-money is paid. If the vendor takes security, the court will inquire whether the security was taken in lieu of the purchase-money: if it was, the V. L. does not hold. V. L. is recognized in many states of the Union; in others it has been abolished by statute, or it is not recognized by the courts.

VENDUE, n. *vĕn-dū'* [OF. *vendue,* a sale (see VEND)] public auction.

VENEER, v. *vĕ-nēr'* [Ger. *furnieren,* to veneer, to inlay —from F. *fournir,* to furnish (see FURNISH)]: to overlay or plate an inferior wood with a thin layer of fine wood for outer finish or decoration; hence, generally, to make superficially attractive or agreeable; to give a gloss to: N. a thin sheet of a more valuable and ornamental wood for overlaying an inferior kind. Only choice kinds of hard woods are sawn into veneers, and they are usually attached to deal or pine, so as to give the article all the appearance of being made solid. In this way the more costly kinds of furniture-woods are economically used by the cabinet-maker; for, with the improvements in the process of sawing, veneers as thin as paper have been produced. VENEER'ING, imp.: N. the process of decorating ordinary wood-surfaces with thin slices of rare and beautiful woods; the fine wood employed in the overlaying. VENEERED', pp. *-nērd'.*

VENERATE, v. *vĕn'ėr-āt* [L. *venĕrātus,* pp. of *venĕror,* I reverence—akin to Skr. *wan,* to worship: F. *vénérer,* to venerate]: to regard with the highest degree of respect and reverence; to esteem as sacred; to revere. VEN'ERATING, imp. VEN'ERATED, pp. VEN'ERA'TION, n. *-ā'shŭn,* the highest degree of respect and reverence; respect mingled with some degree of awe. VEN'ERATOR, n. *-ā-tėr,* one who reveres. VEN'ERABLE, a. *-ă-bl* [F. *vénérable*—L.]: worthy of the highest respect; rendered sacred by religious associations or by age; aged; the style of an archdeacon. VEN'ERABLY, ad. *-ă-blĭ.* VEN'ERABLENESS, n. *-ă-bl-nĕs,* the

state or quality of being venerable. VEN'ERABIL'ITY, n. *-bĭl'ĭ-tĭ*, in *OE.*, venerableness.—SYN. of 'venerate': to reverence; adore; worship.

VENEREAL, a. *vĕ-nē'rĕ-ăl* [L. *venĕrĕus*, of or pertaining to Venus—from *Venus*, the goddess of love]: pertaining to or arising from sexual intercourse. VENE'REOUS, a. *-rĕ-ŭs*, exciting to sexual intercourse; lecherous. VENERY, n. *vĕn'ĕr-ĭ*, sexual intercourse; the gratification of sexual desire. VENEREAL DISEASE: see SYPHILIS.

VENERIDÆ, *vē-nĕr'ĭ-dē:* family of lamellibranchiate mollusks, having a regular, closed, bivalve shell; the teeth and laminæ of the hinge near together in a single group under the beak (*umbo*); generally three diverging teeth in each valve; a marked oval impression in front of the beak; the general form similar to that of the cockles (*Cardiaceæ*), but usually more flattened. The mantle has a large opening in front; the siphons are unequal, more or less united; the foot is tongue-shaped, compressed, sometimes grooved, and producing a Byssus (q.v.). The species are very widely distributed, but abound chiefly in tropical seas. The V. are generally elegant in form, and often finely colored. Some have the shell furnished with long spines, but chevron-shaped lines are their common ornament. The typical genus *Venus*, 176 living species, is of world-wide distribution. The common round clam or quahaug of our coast is the *Venus mercenaria*, so called because the Indians used its shells for making wampum. Other genera of the family are *Cytherea* (113 recent species), *Meroe*, *Trigona*, *Artemis*, the rock-boring *Petricola*, *Tapes*, etc. The V. appear first in the oolitic rocks, and are more abundant in the present than in any former geological epoch.

VENERY, n. *vĕn'ĕr-ĭ* [F. *vénerie*, hunting—from L. *venāri*, to hunt]: hunting; the chase; in *OE.*, what is hunted.

VENERY: see under VENEREAL.

VENESECTION, n. *vē'nĕ-sĕk'shŭn* [L. *vēna*, a vein; *sectĭō* or *sectĭōnem*, a cutting—from *seco*, I cut]: act or operation of opening a vein for letting blood; blood-letting; phlebotomy. The operation may be performed on any of the superficial veins, but is usually restricted to the veins at the bend of the elbow. Of these veins, the most prominent are the median-cephalic and the median-basilic; the former on the outer side of the tendon of the biceps muscle, the latter on the inner side, and separated from the brachial artery by a thin layer of fascia. Hence, in order to avoid wounding the artery, the median-cephalic should be preferred; but in reality the median-basilic is usually selected, because it is the larger and more prominent vein of the two. The appliances required are a lancet, a bleeding-tape or narrow bandage, lint, a bowl to receive the blood, a basin of water, and a sponge. The patient being placed in a sitting position, the tape or bandage is tied around the middle of the upper arm, tight enough to arrest the venous circulation without materially affecting

the pulse at the wrist. The forearm having been allowed to hang down till the veins are tense, the operator taking the blade of the lancet between the forefinger and thumb of the right hand, and having fixed the vein by pressing his left thumb upon it just below the part he is about to open, steadily (and without jerk or plunge) introduces the point of the lancet obliquely until the interior of the vessel is reached, and the blood is seen rising up. Without penetrating deeper, he then thrusts the instrument forward, so as to open the vein longitudinally to a sufficient extent. On removing the thumb, the blood should emerge in a full jet; but if the stream be scanty, the patient may have a hard object, e.g., as the head of a walking-stick, placed in his hands with directions to grasp it firmly. Another way of increasing the flow of blood is to chafe the palmar surface of the forearm, rubbing from below upward. When a sufficient quantity of blood has been abstracted, the thumb of the left hand should be placed on the wound, and the ligament loosened; a small pad of lint is then placed over the orifice, the surrounding parts cleaned of blood by a sponge, and the pad of lint compressed against the arm by the tape or narrow bandage, applied in the figure-of-eight form, with the crossing, of the tape lying on the pad. The arm should be carried in a sling for a day or two. Among the occasional ill consequences of venesection are: (1) The escape of blood into the surrounding cellular (or connective) tissue, giving rise to a swelling called *Thrombus*, which, if it does not rapidly become absorbed, should be emptied by the lancet: this is due to a lack of coincidence between the wound in the integument and in the coats of the vein. (2) Phlebitis, which generally arises from the use of an unclean lancet. (3) Varicose aneurism, and (4) Aneurismal varix, both of which may be included under the term Arterio-venous Aneurism (see ANEURISM).

In children, and occasionally in others, where the veins of the arm are small and undefined, blood is drawn from the external jugular veins; but this operation should be limited to extreme cases, and performed by a surgeon only; inasmuch as the entrance of air into the vein during the operation or until the orifice of the vein has been closed, would cause instant death. The knowledge of this fact has been applied to the slaughtering of oxen, horses, etc. —as one of the most humane modes of destroying life.

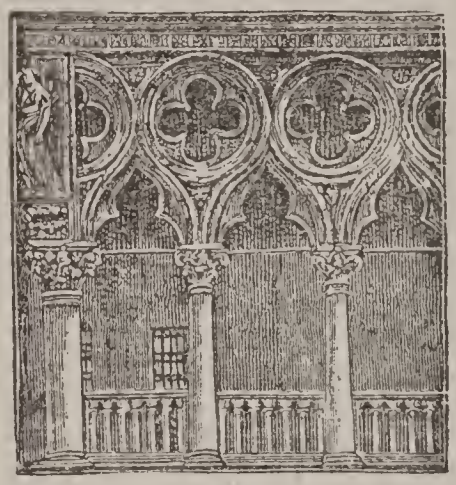
A patient can bear a much greater loss of blood when in the horizontal position than when sitting, and in the sitting position a greater loss than when standing. The condition required to be produced is that there should be incipient faintness; and the loss required to produce this effect varies greatly in different individuals and in different diseases. Dr. Marshall Hall, in his work *On the Effects of the Loss of Blood*, states that the average loss of blood required to produce slight faintness in a healthy person in the sitting position is 15 ounces. In some diseases a greater loss than this can be borne, in other diseases less. The greatest loss can be borne in congestion of the head,

or tendency to apoplexy (50 to 40 ounces); then in inflammation of the serous membranes and of the parenchymatous substance of various organs (40 to 30 ounces); then acute anasarca (about 20 ounces); and then inflammation of the mucous membranes (about 16 ounces).

Blood-letting was formerly a ready resort in medical treatment for a multitude of diseases. It is largely disused in modern practice; and the question has been debated whether it should not be discarded altogether. But in properly selected cases, it remains an indispensable remedy. See Quain's *Dictionary of Medicine* (1882), Wiltshire's article on Abstraction of Blood.

VENETIA, Territory of, ceded to Austria 1815 (see Venice—*History*), formed from that year, with Lombardy (q.v.), what was called the Lombardo-Venetian Kingdom, one of the Austrian crownlands. In 1859 Lombardy was ceded to Italy, but V. continued in the possession of the Austrians till 1866, when, as one of the results of the famous 'Month's War,' it also was ceded to Italy, and is now incorporated with that kingdom. While still in Austrian possession, V. was regarded as bounded n. by the Austrian crownlands of the Tyrol and Carinthia; e. by Görz and Gradisca; s. by the Adriatic Sea, the river Po, and the Duchy of Modena; and w. by the river Adige and the Tyrol. The territory of V., ceded to Italy by the treaty of peace 1866, Oct. 3, has the same frontiers which it had as an Austrian province: area of the prov. of Venetia 9,059 sq. m.; pop. (1881) 2,814,173; (1901) 3,134,467.—See Venice.

VENETIAN, a. *vĕ-nē'shan:* of or from *Venice*, in Italy: N. a native of Venice; a Venetian blind. VENETIAN BLIND, a blind for windows formed of long, flat, thin slips of wood, so hung as to be made to stand horizontally above each other, or to overlap. VENETIAN CARPET, carpet with a worsted warp or chain, generally arranged in stripes of different color, the filling or weft, usually black, being concealed and exposed alternately with the warp on both sides. VENETIAN CHALK, a variety of soap-stone or steatite, sometimes used in manufacture of drawing-crayons. VENETIAN RED, n. true Venetian red is said to be a native ochre, but the colors sold under this name are prepared artificially from sulphate of iron, or its residuum in the manufacturing of acids. They are all of redder and deeper



Venetian Architecture. (Arcade from the Doges' Palace, Venice.)

hues than light red; are very permanent, and have all the properties of good ochres. Scarlet ochre, Prussian red, English red, and rouge de Mars are other names for the same pigment. VENETIAN SCHOOL, in *paint.*, school of painting which arose and declined in the 16th c., and of which Titian (q.v.) is considered the founder. Among its other masters were Giorgione, Tintoretto, and Paul Veronese (see these titles). The distinguishing characteristics of this school were a mastery of color and a consummate knowledge of Chiaro-oscuro (q.v.). See PAINTING. VENETIAN WINDOW, a main window, with a long and narrow window on each side. VENETIAN TALC, a kind of indurated common talc or steatite, used when reduced to powder for making the colored crayons called pastels.

VENE'TIAN STYLE of Architecture: particular phase of the Renaissance developed in Venice. See ITALIAN ARCHITECTURE. The V. is the most picturesque and ornate of the Italian styles. 'Venetian-Gothic' indicates the peculiar phase of that style common in Venice and n. Italy, and applied chiefly to domestic architecture. See GOTHIC ARCHITECTURE.

VENEW, n. *vĕn'ū*, or VENEY, n. *vĕn'ā* [F. *venue*, a coming—from *venir*, to come]: in *OE.*, a bout or turn at fencing; a thrust; a repartee; a sally of wit.

VENEZUELA, *vĕn-ē-zū-ē'la:* republic in the n.w. of S. America; bounded n. by the Caribbean Sea, w. by the United States of Colombia (New Granada), s. by Brazil,

e. by Brit. Guiana; lat. 1° 20′—12° 25′ n.; long. 59° 45′—73° 17′ w.; extreme length (as claimed) e. to w. about 1,400 m., extreme breadth n. to s. about 1,100 m. In 1854 there were 13 provinces—Apure, Barcelona, Varinas, Barquisimeto, Carabobo, Caracas, Coro, Cumana, Guiana, Maracaibo, Margarita, Merida, and Truxillo—aggregate pop. 945,408. The number of provinces was afterward increased to 21. In 1863, after the federal victory over the unionists, the number of *states* was reduced to 7; but according to the constitution of 1881, this number has been increased to 9 great states, viz.:—State of the East, Guzman Blanco, Carabobo, State of the Southwest, State of the Northwest, State of the Andes, Bolivar, Zulia, and Falcon; 632,695 sq. m.; pop. (1891) 2,323,527. The boundaries of V. however are not definitely fixed; it claims tracts extending s. of the equator which are claimed also by Ecuador and by Colombia, and in the e. tracts which are claimed by Brit. Guiana (see below). It has been computed that about 440,000 sq. m. are actually under Venezuelan administration. The cap. is Caracas (q.v.); pop. (1889) 70,500.

The coast-line, from e. to w.—from the delta of the Orinoco to the boundary of the United States of Colombia—is 1,584 m. in length. The most easterly part of the coast-line, 150 m. in length, formed mostly by the delta, is washed by the Atlantic, and is very low. The waters of the Gulf of Paria beat on bold and rocky shores. The remainder of the coast-line, including the n. shore of the peninsula of Paria, is washed by the Caribbean Sea; and the coast, mostly low and marshy, is, in parts, precipitous, the mountains rising like a wall from the water's edge. With slight exceptions, the country is abundantly watered. Its great river is the Orinoco, which drains by far the greater part of it, and the course of which is almost wholly within its boundaries. The other large rivers of V. are affluents of the Orinoco (q.v.). Numerous streams flow n. into the Caribbean Sea and into Lake Maracaibo (q.v.), far the largest lake in the country. The Andes enter V. from the w., and divide into two branches, the first of which runs n. toward the coast, under the names Sierra de Perija and Montes de Oca, but rise no higher than 4,200 ft.; while the other branch, running n.e., terminates near the coast, in long. 68° 30′ w., and attains much greater elevation. That part of the n.e. branch of the Andes called the Sierra Nevada de Merida, about 100 m. s. of Lake Maracaibo, contains the only mountain that rises above the line of perpetual snow, whose two peaks are 15,342 and 15,310 ft. high respectively, the loftiest in the country. S. and s.e. of the Orinoco are the most mountainous districts—a vast, confused, and mostly unexplored region; but none of these mountains rise to the height of the main peaks of the Andes. The country comprises vast table-lands, known under the names *Llanos*, *Paramos*, *Mesas*, and *Punos*. Extensive, low, marshy tracts along the coasts and the lake and river banks are abundantly fertile during the dry season. For the most

part, the soil of V. is fertile. In the mountainous district in the s.e., there are great tracts adapted for production of grain. Of this region, the lands not more than 2,000 ft. above sea-level are called *tierras calidas*, or hot lands; those between 2,000 and 7,000 ft. are called *tierras templadas*, temperate lands; and those above 7,000 ft. are the *tierras frias*, cold lands, in which the average temperature is 49° F., and which are mostly uninhabited. The warmest tracts are the palm-lands; and the sago-palm, cocoa-palm, and others, grow here to colossal size, and yield most valuable products. Among the forest trees are mahogany, satin-wood, rosewood, black and white ebony, and caoutchouc; and there are forests of the cinchona or Peruvian-bark tree. The cocoa and coffee trees, sugar-cane, indigo, and cotton plants are cultivated. Vegetables in great variety are raised, and tobacco is a profitable crop. Among wild animals are the puma, ounce, and wild-cat; the jaguar is becoming rare. The alligator, crocodile, boa-constrictor, and rattlesnake are found. Of domestic animals, great herds of cattle and wild-horses roam over the *llanos;* and mules, asses, sheep, goats, and pigs are reared. The inhabitants comprise whites of Spanish extraction; Indians, who are docile and industrious, and are the miners, agriculturists, and manufacturers of the country; some negroes and mixed races. Agriculture is the great pursuit, though only about one-tenth of the area is under cultivation. Manufactures are few; commerce is important, and would be much more so, were there well-constructed roads and other means of conveyance than mules. The principal articles of export are coffee, cotton, cocoa, sugar, indigo, tobacco, salt, hides, live-stock, tallow, horns, sarsaparilla, dye-woods, and timber. The imports are manufactured goods, provisions, and wine. The budget estimates for receipts (1900-1) were $8,116,200; expenditures $8,626,500. Imports (1901) about $14,580,000; exports $24,300,000. The imports (1902) included $20,635,065 from the United States, and the exports $30,537,427 to the United States. Total foreign debt (1902) $25,573,700. The religion of the mass of the people is Rom. Cath., though other forms are tolerated.

History.—The e. coast of V. was discovered by Columbus 1498; Ojeda and Vespucci followed 1499, and, entering Lake Maracaibo, they found an Indian village constructed on piles, to prevent the evil effects of inundation; wherefore they named the place Venezuela, or Little Venice, a name which afterward spread to the whole country. The first settlement was made at Cumana 1520, by the Spaniards; and V. remained subject to Spain till it claimed independence 1811. It then returned to allegiance to Spain, but again revolted 1813, and, forming with New Granada and Ecuador the republic of Colombia, was declared independent 1819. In 1831 the states separated: see COLOMBIA. in 1865 Juan Falcon became pres., but fled 1868, when the unionists overcame the federals. In 1870 the federals regained their supremacy. The boundary between V. and British Guiana was established by arbitration in 1899.

In 1901 Germany, Great Britain and Italy blockaded the coast of V. in order to secure recognition of long standing claims, also redress for citizens of theirs whose property had been destroyed in a revolution. The president appealed to Pres. Roosevelt to propose arbitration, and finally the dispute was settled by the Hague Tribunal. In 1891 the congress of V. deprived the pres. of the right of veto, abolishing slavery and the death penalty, guaranteed freedom of worship, and gave the people many important civil and political rights.

VENEZUELAN BOUNDARY QUESTION: a dispute arising from a disagreement between Venezuela and Great Britain as to their respective boundaries of South American possessions, in which the United States interposed (1895), proclaiming the principles of the Monroe doctrine (see MONROE, JAMES). Between the mouths of the Orinoco and Amazon rivers lies territory which came into the possession of Venezuela 1810, through Spanish title. Adjacent territory, now known as British Guiana, was ceded to Great Britain by Holland 1814. The boundary between the Dutch and the Spanish possessions in S. America was never settled by treaty, and Venezuela and Great Britain through many years could not come to any satisfactory agreement concerning the same. The dispute between these two governments became a grave affair, and resulted 1887 in suspension of diplomatic relations between them, Venezuela claiming all the territory w. of the Essequibo river, and England laying claim to all up to the Pomaron river, w. of the Essequibo. Great Britain had in 1840 claimed the whole Atlantic coast as far as the Orinoco delta; proposed 1844 a boundary-line w. of the Pomaron river; in 1866 claimed to the Guiana river; and in 1890 and 93 proposed still further extension of her claims. Meantime the United States, regarding the claims of Great Britain as seriously conflicting with her policy of non-interference of European governments with the affairs on the American continent (except in the British possessions in Canada), repeatedly endeavored to induce a settlement of the boundary dispute, but without avail. Early in 1895 a joint resolution of congress recommended to Great Britain and Venezuela the submission of their dispute to arbitration. Venezuela was willing to do so, but Great Britain refused, asserting that Venezuela's claim covered a definitely settled part of her domain, and suggesting that interference by the United States was not desired. In the latter part of the same year Pres. Cleveland laid before congress the correspondence between Great Britain and the United States on the subject, accompanied by a message reiterating the principles of the Monroe doctrine; advising the appropriation of money for the expenses of a commission, to be appointed by the executive, to examine and report upon the boundary question at once; and declaring that when such report should have been made and accepted it would 'be the duty of the United States to resist by every means in its power . . . the appropriation by Great Britain of any lands . . . which of right belong to

Venezuela.' By authority of congress the commission was appointed, and both Great Britain and Venezuela agreed to submit to it all documents concerning the dispute, it being agreed that the right of English citizens to property in the disputed territory that had been uncontested for 50 years should not be disturbed. The outcome of this commission was a treaty practically between Venezuela and Great Britain, submitting the claims to arbitration. The tribunal delivered an award 1899, Oct. 3, giving Great Britain her line of 1840, excepting Barima point at the mouth of the Orinoco and a strip of territory between the Wenamu and Cuyuni rivers; but opened the mouth of the Orinoco to Great Britain and both banks of a part of the Cuyuni. War between the United States and Great Britain was narrowly averted.

VENGE, v. *vĕnj:* OE. for AVENGE. VENGE'MENT, n. OE. for AVENGEMENT. VENG'ER, n. *-ér*, for AVENGER.

VENGEANCE, n. *vĕnj'ăns* [F. *vengeance*—from *venger*, to revenge—from L. *vindĭcārĕ*, to avenge (see VINDICATE)]: the infliction of pain or punishment on another in return for an injury or offense; punishment. VENGE'FUL, a. *-fŭl*, vindictive; retributive. VENGE'FULLY, ad. *-lĭ*. TO DO WITH A VENGEANCE, to do with vehemence or in an excessive degree.

VENIAL, a. *vē'nĭ-ăl* [L. *venia*, favor, indulgence: It. *veniale*, pardonable]: that may be pardoned or forgiven; that may be excused or permitted to pass without censure; not extremely sinful or reprehensible; in *OE.*, permitted; allowed. VE'NIALLY, ad. *-lĭ*. VE'NIALNESS, n. *-nĕs*, state of being excusable or pardonable; also VE'NIAL'ITY, n. *-ăl'ĭ-tĭ*. VENIAL SIN, in *Rom. Cath. theol.*, a sin which weakens sanctifying grace, but does not take it away, as *mortal* or *deadly sin* does (see SIN). Rom. Cath. divines infer from many passages of Scripture that there are various grades of guilt in the culpable actions of man, and that these varieties of guilt involve corresponding variation in the liability to punishment. Lowest in this scale of imputability is the class of offenses known as venial, as distinguished from those called mortal. Much difference of opinion exists among Rom. Catholics themselves as to the nature and origin of this distinction. Some ancient writers explained mortal sins as being offenses against a *precept*, whereas venial sins are but violations of a *counsel*. This explanation is now universally rejected; and it is held that sin, of its very essence, whether mortal or venial, supposes the violation of a *law* or precept. Another explanation of the difference declares mortal sin to be that which deprives the soul of sanctifying grace; whereas V. S. only weakens and diminishes, but does not utterly extinguish sanctifying grace in the soul. This is an explanation, however, rather of the effect than of the nature of V. S.; and the more received opinion is that of St. Thomas Aquinas, who explains mortal sin to be that which of itself subverts *the end* of the law; whereas V. S. diverts the law in greater or less degree from that to which God intended that it should be

directed. Rom. Catholics, while insisting on this distinction, are careful to explain that V. S., though absolutely pardonable, is not to be supposed to be easily pardonable. They hold that it is of its own nature a great 'deordination,' and that it may and does entail heavy liability to punishment, though not to the eternal punishment of hell, which is reserved for mortal sin. Sins may be venial either objectively or subjectively; objectively, when the 'object' of the law, or what is technically called the 'matter' of the sin, is light or trivial; e.g., in a petty theft, a slight departure from truth, or a passing ebullition of impatience or anger; subjectively, when, even though the 'matter' or 'object' is grave, there is but imperfect advertence, or not full consent, on the part of the subject or agent; e.g., in even a grievous injury done without the doer's full knowledge or intention, or without full and deliberate consent. The degree of culpability in each case is supposed to depend on the objective or subjective qualification of the act. Rom. Catholics hold that persons dying in a state of V. S. are not excluded for ever from heaven; but that since nothing unholy, even though in a minor degree, can approach God, the soul departing from life so stained with V. S. is compelled to undergo purification in Purgatory (q.v), which they conceive to be of greater or lesser severity and duration according to the degree of culpability. Some of these writers teach that even venial sins involve punishment of extreme severity; and all expressly declare that it is never lawful, under any circumstances, to commit the smallest V. S., even for the purpose of compassing a good and holy object.

Protestants reject the whole doctrine of *mortal* and *venial* sins. They regard all sins as, in one sense, *mortal*, i.e., as exposing the sinner to 'the wrath and curse of God, both in this world and that which is to come;' but all sins of the believer are expiated by the blood of Christ, and are forgiven to the utmost, so that there remains no penalty to be paid, either by penances in this world, or by sufferings after death: they hold also that 'the sin of the world' is so 'taken away' by the Lamb of God (Jn. i. 29) that nothing remains for any human being to do in relation to his sins except to avail himself of his privilege, heartily to repent of them, and to turn from them to God as He is manifested in Christ Jesus. The very notion of venial sins appears to them to make light of the law of God; while that of the expiation of venial sins by the sufferings of the sinner himself is inconsistent with their doctrine of justification, and with their views of the efficacy of the sacrifice of Christ for forgiveness of sins.

VENICE, *vĕn'ĭss:* famous and remarkable fortified city of n. Italy; built on a crowded cluster of marshy islets, in the lagoon of V., on the n.w. fringe of the Adriatic Sea, 23 m. e. of Padua by the Milan and Venice railway; lat. 45° 25′ n., long. 12° 20′ e.; extreme length of the city (main portion) 2½ m.; extreme width 1¼ m. V. is now the second seaport of the Adriatic. Pop. (1797) nearly 200,000; (1830) about 100,000; (1881) 132,826; (1901) 151,840.

The lagoon of V. is banked off from the Adriatic by a long, narrow sandbank, extending s.w. from the mouth of the Piave to that of the Adige, and divided into islands by six narrow sea-passages. The chief of the entrances into the lagoon is the *Porto di Lido* on the e., through which all the great foreign merchant steamers passed direct into the city, and which was deepened by breakwaters constructed at great expense in 1882-95. The Porto di Malamocco, bet. the island of the same name on the s., and that of Lido on the n., is another deep channel into the lagoon. Inside of this sandbank, and between it and the mainland, three to five m. distant, is the lagoon —a sheet of shallow water, navigable for vessels of very light draught, except where channels have been formed naturally by rivers, and artificially maintained. In some parts of this marshy, sea-covered plain, islets have—by the action of currents and otherwise—become consolidated into ground firm enough to be built upon, and fruitful enough to be cultivated; and in the midst of a crowded cluster of such islets, stated to amount in number to 117 (of which perhaps 70 or 80 may be regarded as principal), the city of V. stands. In the vicinity of V., the ebbing tide (the difference between high and low water is usually only about 20 in.—on rare occasions, from exceptional causes, approaching 6 ft.) lays bare nearly everywhere a great plain of calcareous mud, laced by an intricate network of narrow channels, from which the sea never retires; while at high water the whole surface is covered by the sea to the depth of 1 to 1½ ft. The chief of the islands upon which V. is built is called *Isola de Rialto* (i.e , *rivo alto*), or Island of the Deep Stream. The islands, in many places only shoals, afford no good foundations for buildings; and the city mostly is built on artificial foundations of white poplar piles (10 to 11 in. diameter, driven nearly touching one another) or of stone. The fact that this city of marble palaces seems to rise vision-like from the unsubstantial sea, is sufficient to render its aspect at all times fascinating; but in summer and autumn, seasons of the highest tides, when the Grand Place of St. Mark's is partially flooded, and when the image of each palace is doubled by reflection in that 'green pavement, which every breeze breaks into new fantasies of rich tesselation,' the city is marvellously beautiful. The Canalazzo, or Grand Canal—its tortuous course through the city being in the form of the letter S reversed—divides V. into two unequal parts, and is the main thoroughfare for traffic or pleasure. But the city is subdivided by 146 smaller canals, or *rii*, as they are

termed: these are the water-streets of V., affording conveyance to any quarter; for here the canal is the street, and the Gondola (q.v.) is the carriage. In 1880 omnibus gondolas were introduced on the Grand Canal. Access can be had to all parts of the town by land also—across the canals by 380 bridges, and among the houses by narrow lanes called *calli*. There are 306 public bridges, and of these, three cross the Grand Canal—the famed Rialto, a stone structure, and two modern iron bridges, inharmonious with the scene. The Piazza or Square of St. Mark's is the great centre of business and amusement, and the locality most visited by travellers: it is 576 ft. in length, 269 ft. in greatest width, and 185 ft. in least width. The e. side of this square is occupied by St. Mark's Church. The first church of St. Mark's, built 813, was destroyed by fire 976. It was rebuilt 1071, and consecrated before the close of the 11th c. The edifice is Byzantine, with Gothic additions of the 14th c., and Renaissance alterations of the 17th c. It became the cathedral and seat of the Patriarch 1807. The plan of St. Mark's is the Greek cross. Above the doorway are the four famous colossal bronze horses (Græco-Roman in origin) which Enrico Dandolo brought to V. after the conquest of Constantinople 1204, which were carried away by Napoleon to Paris 1797, and restored to V. by Francis of Austria 1815. A great dome rises over the intersection of the lines of the cross; and over the transepts other domes arise. The carved work, which is very profuse, is exquisite; and the building is perfect as an example of the delicately colored architecture of the East. The structure is of brick, incrusted with richly colored marbles. To the right of this beautiful edifice is the *Torre dell Orologio* (1494), with a splendid clock-dial in gold and azure, and very complex and ingenious movements. The n. side of the square is almost entirely occupied by the *Procuratie Vecchie* (1517), for accommodation of the Procurators or trustees of San Marco, who had the care of the edifice, the management of its property, etc. Facing the Procuratie Vecchie, and on the s. side of the square, are the buildings of the *Procuratie Nuove*, connected with a façade, which forms the w. side of the square; and the two buildings constitute the *Palazzo Imperiale*. Leading s. from the Piazza is the Piazzetta, or Little Square; and near the point where it makes an angle with the great square, was the Campanile, or Bell Tower, of St. Mark, at some distance in front of the building to which it belonged. It was begun 902 completed 1510; was 323 ft. high, 42 ft. wide at the base and was surmounted by an angel. In July, 1902, it fell in ruins, but steps were taken to rebuild it. On w. side of the Piazzetta are the old Library and the Mint, the former now forming a part of the Palazzo Imperiale. S. of the Piazzetta are the two famous red granite columns of V., one of which is surmounted by a figure of St. Theodore, patron saint of the republic till St. Mark supplanted him; the other covered by the lion of St. Mark. On the e. side of the Piazzetta stands the Palazzo Ducale or Doge's Pal-

ace. The first palace was reared on the site of the present one 813; and though frequently enlarged, rebuilt, and redecorated, it retained throughout the character of a Byzantine structure. In 1301 its architectural character began to change; and till 1423 all the rebuilding and enlarging were executed in Gothic. There are no buildings in Venetian architecture, properly so called, of date later than 1423; and the alterations in the Ducal Palace after that time, as well as the palaces subsequently built, which took their style of architecture from the Doge's Palace, were in Renaissance, and like almost all the architecture now to be seen in V., 'of immeasurably inferior spirit in the workmanship' to that native style which flourished with the republic, and decayed with it. Starting from the landing-place of St. Mark's at the e. extremity of the Grand Canal, and proceeding w., a great number of palaces are passed. In former times, these palaces, or the magnificent buildings which occupied the same sites, were the warehouses and places of business of the great merchant-princes, most of whom possessed mansions in the suburbs, i.e., on some neighboring island, which afforded more privacy than could be found in the city itself. Notable among the palaces are the *Palazzo Giustiniani*, now the *Albergo dell' Europa*, perhaps the best hotel in V.; the *Palazzo Contarini Fusan*, a beautiful specimen of the richest Venetian Gothic of the 14th c.; on the left bank, the *Palazzo Pisani a S. Polo*, in arabesque Gothic of the beginning of the 15th c.; further on, on the right, the *Palazzo Loredan*, the *Ca' d'Oro*, a building of the 15th c.; in the oriental style, restored by Mademoiselle Taglioni, the celebrated dancer. The bridge of the Rialto crossing the Grand Canal consists of one arch, whose span is 91 ft., and the height from the water 24½ ft. The bridge with a width of 72 ft., is divided into three streets—the middle one 21 ft. wide—and two rows of shops. The Bridge of Sighs (*Ponte dei Sospiri*) stretches across the canal called the Rio Palazzo, and communicates between prisons on the e., and the Doge's palace on the w. bank of the canal. It is a covered gallery; and prisoners, when led to execution, passed from their cells across this gallery to the palace, to hear their sentence of death, and then were conducted to the scene of execution between the red columns.

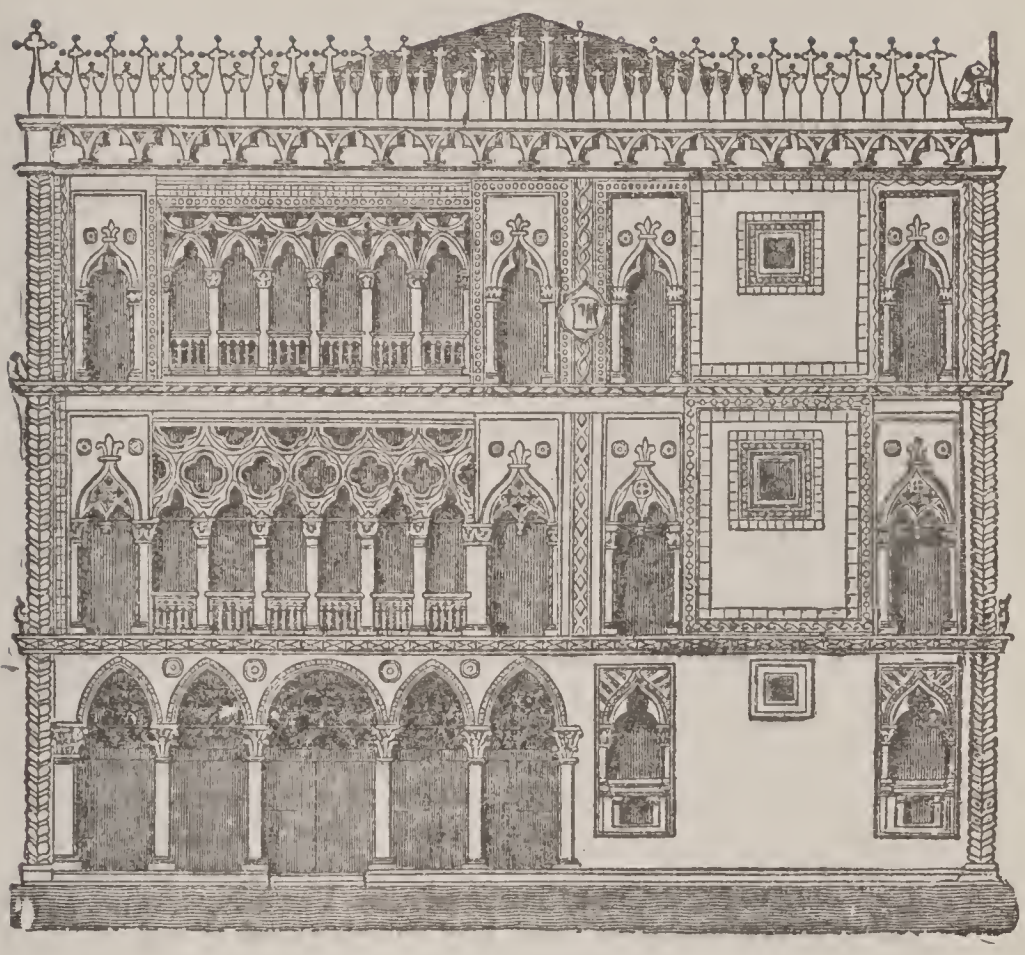
The churches of V. are, as a rule, fine edifices, and of various styles. The styles are chiefly: first, Venetian Gothic, massive and solemn; second, Lombard; third, classical, i.e., Italian; fourth, decorated Italian. Among the chief churches after St. Mark's are those of the *Frari*, with a colossal monument of Titian, a number of excellent pictures, etc.; and the church of *S. Giacomo di Rialto*, at the foot of the bridge of the same name, occupies the site of the first church erected in V. 421. But of the multitude of churches a great many, though of pleasing proportions, are in the later and degraded styles of architecture. The Fine Art *Academia* is in the ancient convent of *La Carità*, was formed 1807 by Napoleon; and consists of several schools, and has the finest collection of pictures of

the Venetian school, including works by Titian, Tintoretto, Bonifacio, Giovanni Bellini, Paolo Veronese, and many other masters. Specimens of the works of these artists are also in many of the palaces and churches. There are several theatres, the chief of which is *La Fenice.* Fresh water, formerly, and even still to some extent, obtained at great expense, and of poor quality, from the mainland, or kept in cisterns, is now obtained by means of a number of Artesian wells, sunk 1847, at the expense of the municipality. The library of St. Mark's contains 120,000 vols. and 10,000 MSS. Many writers have led to misconception by omitting to note the fact that the V. of to-day is far from being the same city as the V. of earlier and more famous days. On this subject, the following is from Ruskin's *Stones of Venice* (II. 4, 5): 'The Venice of modern fiction and drama is a thing of yesterday, a mere efflorescence of decay, a stage-dream, which the first ray of daylight must dissipate into dust. No prisoner whose name is worth remembering, or whose sorrows deserved sympathy, ever crossed that 'Bridge of Sighs,' which is the centre of the Byronic ideal of Venice; no great merchant of Venice ever saw that Rialto, under which the traveller now passes with breathless interest.' Among the chief manufactories of V. are the glass-works, in which magnificent mirrors, artificial pearls, gems, colored beads, etc. are made; and which employ 4,500 people. Jewelry. especially chains of the precious metals, gold and silver stuffs, silks, laces, velvets, soap, earthenware, wax-candles, etc., also are manufactured; and sugar-refining and shipbuilding are carried on. The trade of V. greatly declined for several years previous to 1866, because of the uncertain political state of the Venetian provinces. Connection with the railway system and the opening of the Suez canal revived commerce considerably. The goods imported consist chiefly of cotton, coals, coffee, colonial products, woolen and linen yarns, and manufactured goods. V. is connected by steamship lines with Trieste and the Orient. Annual imports exceed $60,000,000; while exports exceed $50,000,000. Between 3,000 and 4,000 vessels, including coasters, enter the port in a year.

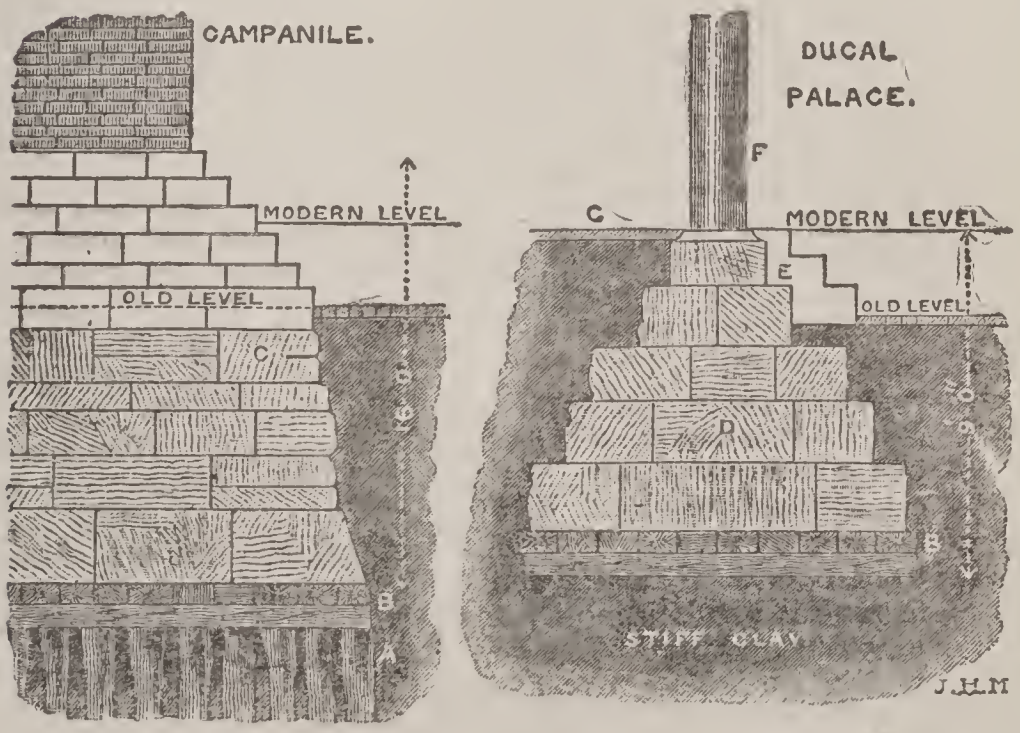
History.—Previously to the Roman conquests, we know almost nothing of history of the district of Venetia, but we know that at the conquest this region was inhabited by two nations, the Veneti and the Carni. The Veneti, from whom the district derived its name, occupied the tract between the Plavis (Piave) on the n., the Athesis (Adige) on the s. The origin and affinities of this people are unknown; and almost the first thing ascertained concerning them is, that in the very earliest times of which we have any record, they were a commercial rather than a warlike community, carrying on a trade in amber, which they brought from the shores of the Baltic, and sold to the merchants of Phœnicia and Greece. Under the Roman Empire, the province became opulent and flourishing; and besides its capital, Aquileia, which rose to be one of the most prosperous cities in Italy, it contained the power-

ful and wealthy provincial cities, Patavium (Padua) and Verona, and numerous important towns. But before the close of the empire, the early prosperity of this province was swept away by the Huns under Attila, who, 452, razed Aquileia to the ground, and devastated the cities of Concordia, Altinum, Patavium, Vicentia, Verona, and other cities. Many of the inhabitants of these cities, driven from their ruined homes, sought shelter in the marshy lagoons, in a position too miserable to provoke the ambition of the conquerors, and defended from invasion from the mainland by the wide tract of muddy shallows between it and the actual shore, and secured against attack by sea by the shallowness of the water and the intricacy of the sea-passages. Of the cluster of islands on which ancient V. stood, the principal were Grado Bibione, Caorlo, Heraclia, Equilo, Torcello, Murano, Rialto, Malamocco, Pelestrina, Brondolo, San Nicolo, Chioggia (Piccola and Grande), Amiano, Constanziaco, Olivolo, and Spinalunga. To Rialto and to Malamocco, the refugees from Padua resorted. The name of the province that they had left was afterward transferred to the cluster of the islands of the lagoon—the new settlement being commonly known, at least as early as the 8th c., as Venezia or as we have it, Venice. Protected by the peculiar position of their island refuge, the settlers engaged in the pursuits for which their situation offered facilities—fishing and the manufacture of salt. Houses began to cluster thickly on the Rialto; and when, 568, Padua was sacked by the Lombards, many of its inhabitants emigrated to that infant colony which their ancestors had helped to found. The first form of government of the island-commonwealth was republican, administered by a consular triumvirate; but 457, the consuls were superseded by tribunes, who, elected annually, and varying in number from one to twelve, administered the government 240 years. But during this period, though the young republic advanced in wealth and population, it gained little political importance. Society was divided into factions by the ambition of the rival tribunes, and variety of interests rendered united action in warfare impossible. With the purpose of remedying the many evils of the government, Cristofero, Patriarch of Grado (island) 697, laid before the Arengo—the periodical convention of the whole adult male population—a scheme in which he proposed that the tribunes should abdicate sovereign power, and that a magistrate, with the title Duke or Doge, in whom should be vested undivided authority in civic, ecclesiastical, and military matters, should be placed over them. The proposition was received with favor, and the election fell on Paolo Luca Anafesto, who was invested by the metropolitan with his insignia of office, a crown of gold and a sceptre of ivory, 697, Mar. Anafesto remained at the head of affairs till his death 717, and under his rule the position of the republic greatly improved. Civil discords were in great measure stilled, and the Venetian territory was increased by a strip of the mainland, obtained by treaty from the king of the Lombards. Under Orso,

PLATE 3.



Ca' d'Oro, as originally built.



The two methods of forming foundations, one with piles: A, 10-inch white poplar piles; B. B, double layers of oak plank, the same in both; C, D, rough footings of volcanic stones.

third Doge (720–737), the Venetians entered on that career of enterprise in which their prudence and their valor were always equally conspicuous, and which they pursued thereafter. In 735, the Lombards seized Ravenna, compelling the Exarch (q.v.) to seek shelter in the lagoon, and implore the republic to lend her aid in reacquiring the lost territory. The Venetians—still considering themselves nominally subject to the eastern emperor, besides being solicitous, in the interests of their commerce, of securing the alliance of Constantinople and obtaining the freedom of the seas of the Eastern Empire—supplied the required assistance, and reinstated the Exarch in his vice-royalty. The services of the Doge on this occasion were rewarded by the Byzantine court with the honorary title Hypatos, or Imperial Consul. The common punishment among the Venetians for tyranny was putting out the eyes, and the reigns of several of the doges at this time are but periods of tyranny and excess on the part of the ruler, terminated by exoculation or assassination by the people. By a treaty 803 between Charlemagne and the Emperor of the East, it was stipulated that the maritime towns of Istria and Dalmatia should be considered an integral portion of the Eastern Empire. This stipulation was adhered to till 808, when the aggressive policy of Charlemagne, and of his son Pepin, now king of Italy, prompted Nicephorus, Emperor of the East, to dispatch a squadron to the Adriatic, and to seek the alliance of the Venetians; and as the latter perceived that they had much more to gain from the friendship of the court of Constantinople—the key to the rich waters of the East—than from that of Charlemagne, the alliance was soon cemented. War immediately broke out; and V. was invaded by King Pepin, who took a number of the islands without resistance—the inhabitants having been transferred to the central island, Rialto. The French advanced to the island of Albiola, when, to their dismay, they found that the tide had been ebbing, and that their vessels were stranded in these shallows. The whole French squadron now fell an easy prey to the swift moving galleys of the Venetians; and such of the enemy as escaped being drowned, were massacred by the relentless islanders (809). This struggle, called the battle of Albiola, was conducted on the part of the republic by Angelo Badoer, tribune of the island of Rialto, who was raised to the ranke of Doge, and transferred the seat of government to Rialto—the island of Heraclia and others having previously had that honor. In his reign, also, connection was established between Rialto and all the circumjacent islands, by means of wooden bridges, and the cluster thus united now formally took the name Venezia (Venice), though it had commonly received that name early in the previous century. The year 829 is memorable as that in which, according to tradition, the body of St. Mark was transferred to V. from Alexandria. 'That the Venetians possessed themselves of his body in the 9th c., there appears,' says Ruskin, 'no sufficient reason to doubt;' and however we may regard this story, it cannot be denied

that the belief in it by the Venetians and others attracted crowds of pious pilgrims to Rialto, and thus increased the traffic and prestige of the port; while the Venetians adopted St. Mark as their patron saint; and their war-cry, 'Viva San Marco!' inspired their courage in many a fight on sea and land. For many years after this date the history of V. is marked by no event of special note; but the naval importance, the commerce, and wealth, and refinement of the republic, increased year by year. Doge Orseolo II. (991–1008) greatly extended the trade of the republic by establishing commercial relations between it and the empires both of the East and West, the Crimea, Syria, Egypt, Tartary, Tunis, etc.; and under his rule, the territory of V., which had comprised only the islands of the lagoon, and a narrow strip on the mainland, was increased by further acquisitions on the mainland, and by the addition of the sea-boards of Dalmatia and Istria, which he annexed 998. In 1085 the provinces of Dalmatia and Croatia were formally ceded to V. by the Emperor of the East; and at the same time the emperor exempted the Venetian traders in all parts of the empire except Cyprus, Candia, and Megalopolis, from all duties and imposts. In 1099, V. sent forth a fleet of 207 vessels of all sail to the succor of Godfrey de Bouillon and his companions of the First Crusade. The defeat of a hostile Pisan fleet employed by the eastern emperor, Alexius Comnenus, and the capture of 20 of the vessels, and the obtaining of the body of St. Nicholas at the island of Myra, were the chief incidents of this expedition, which partook more of the nature of a predatory cruise than of a pilgrimage and crusade. But it is noticeable that in all the cases in which V. joined the Crusaders, the chief motive seems rather to have been to monopolize the maritime department of all these movements, and to extend her commercial relations, than to secure the Holy Sepulchre in Christian possession. The great fires of 1106, which, besides destroying the island city of Malamocco, reduced 30 churches and vast numbers of private dwellings in V. to ashes, were indirectly the cause of great improvements in the architecture of the city; for previously to this event almost all the dwellings were of wood; but after it, the material used was either stone or marble from Italy, Istria, or Dalmatia, in all of which it is abundant.

In 1111 the Doge Faliero sent forth 100 galleys to aid Baldwin I., successor of Godfrey de Bouillon, in the conquest of such Syrian ports as remained in the hands of the Mussulmans; and for this assistance the Venetians obtained the right to hold in possession a church, street, mill, bakery, bath, etc., and to be represented by a local magistrate in each of the oriental possessions of Christendom—rights of the greatest importance to a trading community. In 1123 a fleet sent to succor the Christians in Palestine, and led by the Doge Michieli, distinguished itself by a magnificent victory over an Egyptian fleet, and by the capture of ten Turkish galleons richly freighted. In the same year the Venetians and their allies, the Christians

in Palestine, reduced the almost impregnable city of Tyre, after a siege of four and a half months. In 1122, a decree was passed by Johannes Comnenus, Eastern emperor, commanding the Venetian residents at Constantinople and the other Greek ports to quit the imperial dominions, and declaring the suspension of all intercourse between the two powers. The islanders thus saw the most profitable branch of their commerce threatened with extinction; and for reprisals, they launched a fleet 1123; and in that and the following year they inflicted a terrible punishment on the empire, capturing Rhodes, and investing and sacking Andros, Samos, etc., all the Ionian islands, a portion of the Peloponnesus, etc. Further, this brilliant expedition was not brought to a close until all the Dalmatian fiefs, stirred to insurrection by Stephen, King of Hungary, were again reduced to submission. The Venetians were prominent members of the League of Lombardy against the German emperor; and 1177 won a splendid victory over the Ghibellines headed by Otho, son of Frederick Barbarossa, in defense of Pope Alexander III., who had appealed for protection to the republic. Otho's squadron numbered 75 sail, drawn chiefly from the ports of Genoa and Ancona: the Venetian force consisted of 34 large galleys; and their victory influenced the pope to show his gratitude by presenting the Doge Ziani with a ring, with which he commanded him to wed the Adriatic, that posterity might know that the sea was subject to V. 'as a bride is to her husband;' and it is recorded that in this year first was celebrated the pompous ceremony of the 'marriage.' The result of the naval battle of Saboro was that Frederick agreed to a congress at Venice 1177. On the occasion of this congress, when the pope, the Doge, and other dignitaries were assembled in the palace of St. Mark's, Frederick, approaching the throne on which Alexander III. was sitting, and prostrating himself, allowed the pope to plant his foot upon his neck. The Congress of V. restored peace between the empire and Lombardy and Sicily. The Doge Ziani died 1178. He did much to improve the architecture of the city, especially of the Square of St. Mark. Of the three lofty red granite pillars which he is believed to have brought from the island of Scio, two adorn the portico of St. Mark's—the third fell overboard and was lost in the attempt to land it. In 1202, Oct., the expedition known as the Fourth Crusade set out from V., in Venetian vessels, under the command of the venerable Doge, Arrigo Dandolo: it did not reach Palestine, but directed its force against the Byzantine Empire, which fell into the hands of the so-called Crusaders 1204, Apr.: see DANDOLO. On the division of the conquests of this expedition, V. received the Morea, the Illyric Isles, a large portion of Thessaly, the Sporades, the Cyclades, the cities of Adrianople, Trajanople, Dedymotichos, and Durazzo, the province of Servia, and the coasts of the Hellespont. A fourth part of Constantinople was set apart as a quarter where Venetians might reside, under the protection of their own laws; and all restrictions as

to trade were abolished. V. was now in possession of the fairest portions of the Lower Empire, and she had long been undisputed mistress of the seas. As she increased in power, she increased in magnificence; and her nobles, having no lands in which they might employ their wealth, lavished immense sums on their palaces, their pictures, decorations, and costly garments. Her palaces were decorated with the treasures and spoils of the East, and a school of artists arose, who found noble subjects for their pencils in the deeds of Faliero, Polani, Ziani, and the Dandoli. Her noblemen were now the most opulent in Europe, and travel and refinement had made them also the most polished.

The most notable events in the history of V. during the 13th c. are her wars with Genoa, in which her previous good fortune deserted her; and the star of Dandolo succumbed to that of Doria at the desperate battle of Corzuola, from which conflict the Venetians could retire with only 12 out of their 96 galleys, the others being taken or burned; the truce effected between V. and Palæologus, Emperor of the East, 1268; the electoral reforms by which, after a complex and often repeated process of election and reduction by lot, the 41 members were chosen who formed the Electoral College, and of whom it was necessary that the Doge-elect should obtain the votes of 25 at least. In 1289 the inquisition was formally established in V., but subject to so many limitations by the government of the republic, that it was comparatively harmless In 1310 a conspiracy was formed for correction of abuses that had crept into the constitution, and for the punishment of actual and fancied crimes. Among the conspirators were members of many of the noblest families of Venice. This conspiracy, known as the Quirini-Tiepolo conspiracy, proved abortive; but among other reforms to which it gave rise was the formation of the famous Council of Ten, who caused themselves to be declared a permanent assembly 1335. In 1343 Andrea Dandolo, born in the year of the Quirini-Tiepolo conspiracy, a most accomplished scholar and statesman, was raised to the Dogate. His *Venetian Annals*, remarkable for precision and accuracy, place their author in the first rank of mediæval historians. In 1348, the lagoon was visited by an earthquake, accompanied by unusually high and destructive tides. These misfortunes were followed in the same year by a frightful visitation of plague; and during six or seven months two-fifths of the population perished, and 50 patrician families became extinct. The middle of the 14th c. is remarkable for the famous conspiracy headed by the Doge Marino Faliero (see FALIERI), and for a war with Hungary, in which V. lost Dalmatia. The commercial rivalry of V. and Genoa in the East led to a war 1352, in which the Venetians were defeated (1352, Feb. 13) by Paganino Doria in the straits of the Bosporus; and though they recovered their lost laurels in a battle (1353, Aug. 29) off the Sardinian coast, their fleet was totally destroyed by Doria, in the Gulf of Sapienza, 1354, Nov. 3, and they

were forced to make peace in the following May. In 1378, the Venetians interfered in the quarrel between the Genoese and Cypriots, and their fleet vanquished that of the Genoese before Antium (July), in revenge for which the Venetian fleet was almost annihilated off Pola 1379, May, and Pietro Doria, advancing upon V. itself, seized the island of Chioggia. But the courage of the Venetians was not weakened by their dreadful reverses, and they soon changed the aspect of affairs by becoming in turn the besiegers, blockading the enemy in Chioggia, and, after reducing him to the brink of starvation, accepting an unconditional surrender 1380, June. In 1396, Genoa, the oldest and most harassing foe of the republic, ceased to have separate existence as an enemy, for in that year she placed herself under the dominion of the king of France, to the great relief of V., because for several reasons there was now much less chance of a rupture between the two maritime powers. For a number of years after this event, V. experienced the highest prosperity: a prodigious impulse was given to her trade; her argosies traversed every arm of the ocean; intimate intercourse was kept up with every European country, as well as with Syria, Egypt, and even India; and important articles of Venetian merchandise were the iron of Staffordshire, the tin of Cornwall and Devon, and the wool of Sussex. But no less beneficent than the effects of peace were those of the war which soon broke out between Novello, Lord of Padua, and Venice. At the conclusion of this war (1407), V. found herself in possession of a territory on the mainland of Italy, whose smallest communal section equalled their ancient island domain, and of which the principal cities were Vicenza, Verona, Padua, Feltre, and Belluno.

With the death of the Doge Mocenigo 1423, a new era opens in the history of V.; for now 'the central epoch of her life was past. the decay had already begun.' During the next 30 years war was continually waged, chiefly against the Dukes of Milan, in the course of which V., taking into pay Carmagnola (q.v.) and his bands, achieved many a splendid victory, and suffered many a disastrous defeat; and though, on the return of peace (1455), the territory of the republic was materially increased, by acquisition of Brescia, Bergamo, Treviso, etc., on the mainland, this territory was obtained only after a struggle, enormously expensive in life and treasure, during which the commerce of V.—the well-spring of its prosperity at all times—began to decline. Mocenigo's last advice to the senate was to avoid war, which was certain to bring destruction on the country, and to prosecute industriously their trade and commerce, and cultivate the arts of peace. The rejection of this advice, combined with the narrow-minded selfish policy always pursued by the Venetians in the contests among the Italian states, was the prominent cause of its decline. The same fatal warlike policy was pursued throughout the 15th c.; and the whole of the 16th c. was employed by them in repairing the disasters which the league of Cambrai had brought. The policy of V. in the

17th c. was to aid the opponents of her most dangerous neighbor, Austria, by recognizing Henry IV. of France aiding Bethlem Gabor and Ragotski, the Duke of Savoy against Spain, and the Protestants against the Rom. Catholics of the Grisons. From 1646–69 war was carried on between the Venetians and Turks, the Turks being, in almost every encounter, severely defeated; though, from the disproportionate strength of the antagonists, they ultimately gained Candia, the object of the war. The discovery of the Cape of Good Hope by the Portuguese 1486 opened to that nation an ocean route to India, which was taken advantage of by Vasco da Gama, who rounded the Cape on his voyage from Lisbon to Calicut 1497. The carrying-trade of the world was now no longer, as it had been, in the hands of the Venetians; and the vast commercial activity which sprang up among the nations of w. Europe on the discovery of America clearly showed that the naval superiority of the republic had forever disappeared. But even in spite of these changes of fortune V. might still have maintained a respectable mediocrity among maritime states but for the character of her government, which was conducted by an exclusive oligarchy, in whose hands all power and freedom were vested. Long prior to the invasion of the republic by Napoleon 1796, V. had become worn out and corrupted; the government of the Council of Ten had become a reign of terror; its nobles showed vigor only in pursuit of pleasure; its peasants, inured to peace, were unequal to war—all the ancient virtue, valor, and hardihood, which had raised a colony of fishermen, 'perched like sea-fowl' on a muddy shoal, to be a nation of the first rank, had died out of the state. Napoleon 1796 forced V. to break the neutrality which it meant to maintain, destroyed its government, and ceded the province to Austria by the treaty of Campo-Formio (q.v.). In 1806 the city of V., with the territory of Venetia, was annexed to the kingdom of Italy by the treaty of Presburg (q.v.); but it was transferred to Austria 1815. In 1866 the city and territory were ceded to and incorporated with the Kingdom of Italy.

VEN'ICE-GLASS, n.: a glass cup or goblet of rarest purity, manufactured near Venice; believed to be so exquisitely sensitive that it would fly to pieces if poison were put into it.

VEN'ICE-TUR'PENTINE, n.: in *chem.*, a ropy liquid, colorless or brownish, inclining to green, having an unpleasant odor and bitter taste; obtained from *Terebinthina venetia.*

VENI CREATOR SPIRITUS, *vē'nī krē-ā'tĕr spĭr'ĭ-tŭs* ('Come, Creator, Spirit!'): anc. and celebrated hymn to the Holy Spirit; used in the Rom. Cath. Church in the offices of the feast of Pentecost, and at coronations, the creation of popes, the consecration of bishops, ordination of priests, etc. Two versions of it are found in the Anglican Prayer-book—'Come, Holy Ghost! our souls inspire,' and 'Come, Holy Ghost! eternal God.' The author is not known with certainty. On the authority of an ancient life of Notker, it is ascribed to Charlemagne; and Daniel, in his *Thesaurus Hymnologicus*, adopts this opinion; but it seems to be older than the age of Charlemagne; and its correct classical meter, as well as the purity of its language, bespeaks an earlier and purer age. Mone makes it highly probable, by intrinsic evidence, that it is the composition of Pope Gregory I. (Gregory the Great).—The *Veni Creator Spiritus* must not be confounded with another hymn to the Holy Spirit, *Veni Sancte Spiritus*, which somewhat resembles it, but belongs not to the Breviary, but to the Missal, in which it forms a 'Sequence' in the Mass of Pentecost Sunday and Octave. The latter hymn is in rhyme, and evidently of later age: its author is believed to be King Robert of France, to whom several other hymns of the same class are attributed.

VENIRE, *vē-nī'rē*, or VENI'RE FACIAS JURATORES, *fā'shĭ-ăs jū-rā-tō'rēz* [L., cause the jurors to come]: writ directing a sheriff to cause to come to court, on a day specified, a certain number of qualified citizens to serve as jurors in the court. In many states jurors are drawn by lot from the list of qualified citizens of the county or town—the list being made by a special officer, or by the selectmen of towns: thus jurors are summoned without a *venire.*—In Eng. law, *venire facias* is also the name of a writ issued to an officer to cause to appear in court a party indicted for petty misdemeanor on a penal statute.

VENIRE DE NOVO, phrase, *vē-nī'rē dē nō'vō* [L., to come anew or afresh]: in *law*, the granting of a second trial, because of some defect which appears on the face of the record itself; differing essentially from a new trial, which is granted only for matter extrinsic to the record.

VENISON, n. *vĕn'ĭ-zn* [F. *venaison*, venison—from L. *venatĭō* or *venatĭōnem*, a hunting, game—from *venor*, I hunt]: a beast or beasts of the chase, or the flesh of such animals; now specifically applied to the flesh of the deer kind.

VENITE, n. *vē-nī'tē* [L., *Venītĕ, exultēmus Domĭnō,* 'Come, let us sing unto the Lord,' the first words of the old L. version of the psalm]: Psalm xcv., said or sung in liturgical churches at the commencement of Morning Prayer, after the absolution, Lord's Prayer, and Invitatory Sentences.

VENLO, *vĕn-lō':* frontier-town of Holland, prov. of Limburg; on the right bank of the Maas, 45 m. n.n.e. of Maastricht, and 60 m. n.w. of Cologne. The town is well built, on elevated ground, surrounded by morasses. Principal buildings are the town-house, the great arsenal, the Church of St. Martin, etc. V. has good schools and several charitable institutions. The principal trade is with Germany, in coal, stone, lime, iron, bricks, grain, etc.; the chief industries are stone-hewing, tanning leather, dyeing, grinding corn, beer-brewing, and the making of cigars, starch, vinegar, chocolate, Venlo pepper-cake, etc.—V. was a strongly fortified place until 1868, when its forts were dismantled. It was walled by Duke Reynold of Gelder 1343, has often been besieged, and taken and retaken, the last time by the Belgians 1830, in whose hands it remained till the Conference of London, 1839, June 22, when it was returned to the Dutch.—Pop. (1887) 10,550—mostly Rom. Catholics.

VENN, *vĕn,* HENRY: clergyman of the Eng. Church: 1725–97, June; b. Barnes, in Surrey. Having studied and entered into holy orders—following the example of his paternal ancestors since the Reformation—he was appointed curate of Clapham; 1759–69 he was vicar of Huddersfield, in Yorkshire; and then was presented to the rectory of Yelling, in Huntingdonshire. The memory of his pure life and fervent preaching has caused his name to be associated with those of John Newton, Thomas Scott, Charles Simeon, and others, as leaders in the evangelical movement in the Church of England. V. was author of *The Complete Duty of Man,* a sort of development or extension of the *Whole Duty of Man.* His *Life and Correspondence* was pub. by his grandson, Henry V., 1839.

VENNEL, n. *vĕn'nĕl* [F. *venelle,* a narrow street—from mid. L. *venella,* a dim. of L. *vēna,* a vein]: in *Scot.,* a lane or narrow street.

VENOM, n. *vĕn'ŏm* [F. *venin*—from L. *venēnum,* a potion that destroys life: It. *veneno*]: matter fatal or injurious to life, restricted to matter introduced into the system by bites or stings; hence, *figuratively,* anything which acts like poison; spite; malice. VEN'OMED, a. *-ŏmd,* envenomed; poisoned. VEN'OMOUS, a. *-ŏ-mŭs* [F. *venimeux*]: poisonous; armed with poison, as certain animals; noxious; full of malignity; spiteful. VEN'OMOUSLY, ad. *-lĭ.* VEN'OMOUSNESS, n. *-nĕs,* the state or quality of being venomous; malignity

VEN'OMOUS BITES AND STINGS: wounds inflicted by animals which by their bites or stings introduce poisonous or irritating matter into the bodies of their victims. We notice here the most venomous animals (1) among the invertebrata, (2) among the vertebrata. (See Holmes's *System of Surgery*—article 'Venomous Insects and Reptiles.')

(1) Among invertebrata, the most formidable poisonous animals are in the classes *Arachnida*, *Myriapoda*, and *Insecta*. The *Scorpions* are characterized by a prolonged jointed abdomen, terminating in a hooked claw, which is perforated, and connected at the base with poison-glands. The larger species, restricted to hot countries, by their sting give rise to symptoms of great severity, and occasionally cause death. 'The symptoms resemble those produced by the stings of wasps and bees in an aggravated degree, such as acute pain, a general nervous shock, attended with numbness, vertigo, occasionally temporary loss of sight, vomiting, etc.; while the local symptoms are swelling, and other signs of acute inflammation, followed, in many cases, by suppuration, sloughing, and their consequences. The remedy which appears to have obtained the greatest repute is the application of ammonia externally, and its internal administration as a stimulant also; although it is probable that any other diffusible stimulus, combined with opiates, would be equally, if not more, efficacious.' Several species of *Scolopendra*, or *Centipedes*, are regarded as highly venomous, and there is no doubt that the bites of some of the larger kinds inhabiting hot countries (especially of *S. morsitans*) have excessively painful consequences, though less severe than those occasioned by the sting of the scorpion. In these animals the poison is introduced not by a caudal sting, but by perforated curved fangs, connected with the mandibles, where poison-glands doubtless exist, though their existence has not been clearly established on anatomical evidence. Although *Spiders* have long had a bad reputation for venomous bites, it is certain that (with some rare exceptions) their bite inflicts no more than a simple wound. The most ill-famed of the spiders is the Tarantula or Tarentula (*Lycosa tarentula*), a citigrade or running spider, common in s. Italy: see TARANTISM. Direct experiments, however, show that the bite of this spider causes usually only a slight local irritation. There is a spider inhabiting the island of Elba (*Aranea 13-guttata*) which is said to be dangerous and even fatal to men and domestic animals; while the cork-forests of Morocco are said to be infested by an equally formidable spider, there known as the *Tendevaman*. Among insects, many inflict more or less troublesome bites; while a comparatively few (almost restricted to the order *Hymenoptera*) inflict serious injury by their stings.

In the case of the majority of biting insects, it is doubtful whether the local discomfort is due to the introduction of poison, or only to the prolonged mechanical irritation. In some cases, as in the ants, we know that formic acid (an irritant of great power) is introduced; and considering

the prolonged irritation that follows the bites of many small insects, it is probable that there is some special acrid matter in their salivary secretion. This view has further evidence in the fact that persons who suffer much from the bites of fleas and bugs (and the degree of annoyance varies extremely in different persons) are relieved by the local application of hartshorn, or some other preparation of ammonia. The 'Tsetse' (*Glossinia morsitans*), whose ravages are graphically described by Dr. Livingstone, does not attack man; but it affords an example of an insect, very little larger than a house-fly, being able to secrete an intense septic poison, which, introduced by its bites, causes certain death to cattle, the sheep, horse, and dog, while it is innocuous not only to man, but to the goat, antèlope, ass, and pig, to all wild animals, and to the calf until it is weaned. Another insect, mentioned but not described by the same traveller, produces by its bite vomiting and purging in man. In the case of stinging insects, the stinging instrument consists essentially of two fine and sharp darts, inclosed in a tubular sheath having at its base a poison-sac, whose contents are injected into the wound made by the darts, which are usually serrated or barbed. The effects of the sting of a bee or wasp are well known; and the sting of the hornet, a much rarer insect, is of the same nature, but aggravated. The sting of a bee or wasp scarcely ever proves fatal, unless the insect is swallowed in a cavity in ripe fruit, or in the act of drinking, and inflicts its sting on the throat. A sting in the fauces usually excites severe and diffuse inflammation, which may extend to the glottis and thus cause suffocation: the treatment must be prompt, and consists of scarification internally, leeches externally, and possibly tracheotomy. When a large number of any of these insects make a combined attack, the result may be fatal. For the bites and stings of all these animals, the remedy recommended for scorpion-stings must be used—viz., ammonia in some form, and probably sal volatile is the best. Among domestic remedies for the irritation excited by these stings are vinegar, oil, spirits, eau-de-Cologne, the blue-ball employed by washerwomen, consisting of indigo, etc. If possible, the sting should be extracted by bringing it to view by pressure over the wound with a watch-key, and then seizing it by small forceps.

(2) Among vertebrata, the only animals capable of inflicting poisoned wounds are the ophidian reptiles or snakes (for the mechanism of their poison-fangs, see SERPENTS: SNAKE): rabid domestic animals must be added (see HYDROPHOBIA: RABIES). The venom is described, when fresh, as a transparent, yellowish or greenish, somewhat viscid, neutral fluid, much resembling saliva in physical character, and exhibiting no obvious indication of its virulent nature. According to Prince Lucien Bonaparte, it contains, in addition to albuminous or mucous and fatty matters and the usual salts, a peculiar principle, to which he gave the name *echidnine* or *viperine*, which appears to be the active poisonous matter. The poison of the most

deadly serpent produces no effect when introduced into the stomachs of living animals, except a slight irritation of the air-passages; nor is its effect more serious when applied to the surface of the skin when free from abrasion. From the experiments of Fontana and others on the poison of the viper, it seems that the venom must be introduced directly into the subcutaneous cellular tissue. When properly introduced through its natural channel, the poison-fang, 'its effects are very rapidly manifested; in fact, in some cases so rapidly as more to resemble those of prussic acid than anything else; usually, however, a brief interval elapses before the effects are shown. These may be divided into general and local. The first symptoms in nearly all cases appear to be a general shock to the nervous system, attended with faintness, tremor, and great depression, sometimes with stupor, loss of sight, vomiting, lock-jaw, and general insensibility; at the same time, great and sometimes intense local pain is set up. The limb, if the wound is in one of the extremities, rapidly swells. In severe cases the swelling continues to spread till it reaches the trunk, or even the entire body, whose surface assumes a jaundiced hue. The gravity of the effects of the bite of a venomous snake appears to be in direct ratio to the comparative sizes of the snake and its victim, and also to the quantity of the poisonous secretion present at the time in the saccular gland. It is also greatly governed by the situation of the wound; one on an extremity, for example, being far less dangerous than one on the face or trunk. It has been remarked that two or more wounds at distant points are more rapidly effective than when they are inflicted on one spot.'—The poison seems to act primarily on the nervous system, also to have a septic action on the tissues with which it is brought in contact; and in order to produce its effects, it must be directly introduced into the circulation.

Besides the well-known viper there are many snakes whose bite is fatal. America has the rattlesnake; the E. Indies, the cobra da capello, the ophiophagus, Daboia Russellii, etc.; and Africa and Australia abound in poisonous reptiles. For the principal venomous snakes, see the respective titles. The bite of the viper presents in a mild form the typical symptoms which have been described, and is very seldom fatal. In the case of many snake-bites, however, rapid death is the usual result; and should recovery take place, it will often be protracted and imperfect. The symptoms produced by the bites of different kinds of venomous serpents differ considerably in character as well as in intensity, though there is general resemblance.

The treatment may be divided into local and general. The local treatment consists in the *immediate* application of a ligature drawn as tightly as possible above the wound —provided the situation of the latter allow of it—to prevent absorption; and the excision and cauterization of the bitten part; and then, after bathing it with warm water, sucking or cupping it. When the position of the bite prevents free

excision, the poisoned tissues must be destroyed by *Liquor Ammoniæ*, or nitric acid. The general or constitutional measures consist essentially in the very free administration of the most powerful diffusible stimulants, such as hot strong brandy or whisky and water, and ammonia (an ammoniacal preparation, known as *Eau de Luce*, is a popular remedy for snake-bites). In these cases, in consequence of the prostration of the patient, he can bear an extraordinary quantity of stimulants. For the bite of the rattlesnake, the popular treatment is to make the patient drunk—a process known as the *Western Cure*. Olive-oil, freely administered, has been strongly advocated.—An Australian physician, Dr. Mueller, of Victoria, on the theory that the action of snake-venom is dynamic and not destructive of tissue, and that its sole effect is to produce suspension of the motor and vaso-motor nerve centres, has used as an antidote strychnia, whose effect is to increase the functional activity of those centres. He applies this antidote by subcutaneous injection till slight evidences of strychnia action appear. He declares this treatment successful in a multitude of cases, and now in general use in Australia; though experiments in London and Calcutta on cobra-bitten dogs have not shown the desired results.—The following are a few of the so-called specific remedies said to be used in countries where the most virulent serpents abound: decoction of Virginian snake-root; *Radix corineæ;* guaco, or the *Sacra vitæ anchora;* the Tanjore Pill, whose chief ingredient is arsenic: see SNAKE-STONE.

VENOSA, *vā-nō'sâ* (anc. *Venusia*): town of s. Italy, prov. of Basilicata; 100 m. e.n.e. of Naples. Its castle, which dates from the 15th c. and is now in ruins, gives a picturesque effect to the quarter in which it is placed. The Norman Abbey of the Holy Trinity, founded by the Norman Robert Guiscard, and consecrated 1059, though now in ruins, is imposing from its magnitude and regularity, as well as interesting from its antiquity. But the chief interest of V. arises from its being the birthplace of Horace (q.v.). In one of the streets is a column surmounted by the bust of the poet; and many of the localities of the vicinity can be identified with the places that he has made famous.—Pop. (1881) 7,933.

VENOUS, a. *vē'nŭs* [L. *vēnōsus*, full of veins—from *vēna*, a vein: It. *venoso;* F. *veineux*]: pertaining to a vein; contained in a vein, as *venous* blood; in *bot.*, having veins. VENOUS SYSTEM, in *anat.*, the veins collectively. VE'NOSE, a. *-nōs*, in *bot.*, full of veins; applied to parts or bodies that have many branched veins, as in reticulated leaves. VENOSITY, n. *vē-nŏs'ĭ-tĭ*, the state of being venous; a venous condition of the blood.

VENT, n. *vĕnt* [F. *vent*, wind, scent—from L. *ventus*, wind]: a small aperture through which air can escape or a fluid is let out; passage from secrecy to publicity; escape; act of opening; passage; discharge; means of discharge; utterance; a Scotch name for a chimney: V. to let out; to utter; to emit; to publish; in *OE.*, to sniff; to snort.

VENT'ING, imp. VENT'ED, pp. VENTAGE, n. *vĕnt'āj*, in *OE.*, a small hole, as in a flute. VENT'AIL, n. *-āl* [OF. *ventaille*]: the breathing-slip of a helmet. VENT'ER, n. *-ĕr*, one who vents or utters. VENT- or TOUCH-HOLE, the small passage to the chamber of a gun through which fire is communicated to the charge (see GUN). VENT-PEG, a peg for filling up the vent of a close barrel or cask. TO GIVE VENT TO, to suffer to escape; to let out; to pour forth.

VENT, n. *vĕnt* [F. *vente*, sale: Sp. *venta*, sale, a roadside inn—from L. *vendo*, I sell (see VEND)]: in *OE.*, sale; also, a roadside inn: V. in *OE.*, to sell; to let go to sale.

VENTAGE, VENTAIL: see under VENT 1.

VENTER, n. *vĕn'tĕr* [L., the belly]: in *anat.*, the belly; the abdomen.

VENTILATE, v. *vĕn'tĭ-lāt* [L. *ventilātus*, pp. of *ventilārĕ*, to fan, to wave, to toss—from *ventus*, the wind: It. *ventilare:* F. *ventiler*]: to winnow; to expose to the free action of air or wind; to supply with fresh air in order to purify or freshen; to bring under examination or discussion. VEN'TILATING, imp. VEN'TILATED, pp. VEN'TILATOR, *-lā-tĕr*, a machine or contrivance for admitting or for regulating the admission of fresh air. VEN'TILA'TION, n. *-lā'shŭn* [F.—L.]: the art or operation of supplying apartments or buildings with a regulated quantity of fresh air (see WARMING AND VENTILATION); the state of being ventilated; utterance; examination; discussion. VEN'TILA'TIVE, a. *-tĭv*, of or pertaining to ventilation; supplying with fresh air.

VENTIMIGLIA, *vĕn-tē-mēl'yâ:* small fortified town of n. Italy, prov. of Porto Maurizio, and 'circle' or district of San Remo; on a promontory on the sea-shore; 18 m. e. of Nice. Besides an old cathedral, it contains the Church of St. Michel, containing two Roman milestones, and inscriptions by Augustus and Antoninus Pius. The strongly fortified castle above the town, recently repaired and strengthened, is the chief stronghold between Genoa and Nice. Wines and fruits are produced.—V., the anc. *Albium Intemelium*, was the cap. of the Intemelians, a Ligurian tribe; and its possession was contested in the middle ages by the Genoese, the counts of Provence, and the dukes of Savoy.—Pop. (1881) 5,444.

VENTNOR, *vĕnt'nĕr:* watering-place and town on the s. shore of the Isle of Wight, England; 10 m. s.s.e. of Newport, and 12 m. s.s.w. of Ryde; amid the finest of the fine scenery of the Undercliff district. Fossils are found in great quantity in the vicinity. With a s. exposure, and well sheltered from the n., V. has a mild climate, suitable for various classes of invalids, especially for consumptives, and has accordingly become a favorite winter and spring resort. The town is well provided with hotels and lodging-houses. It has a beautiful yellow shingle beach. The pier, constructed 1872, is 645 ft. long.—Pop. (1871) 4,841; (1881) 5,504; (1891) 5,817.

VENTOSE, n. *vĕn'tōs* [F.—from L. *ventosus*, windy—from *ventus*, wind]: name adopted 1793, Oct., by the French Convention for the 6th month of the Republican year—the 3d winter month, beginning Feb. 19: see CALENDAR.

VENTRAL, a. *vĕn'trăl* [L. *ventrālis*, ventral—from *venter*, the belly]: of or pertaining to the belly; abdominal; in *bot.*, applied to that part of the carpel which is nearest the axis, or in front. VENTRICOSE, a. *vĕn'trĭ-kōs*, or VEN'TRICOUS, a. *-kŭs*, distended; swelling out in the middle or unequally on one side. VEN'TRICLE, n. *-trĭ-kl* [L. *ventric'ŭlus*, the belly, the stomach]: a small cavity in an animal body; a cavity in the heart or brain; one of two chambers in the heart whence the blood is pumped out into the arteries (see CIRCULATION). VENTRIC'ULAR, a. *-trĭk'ū-lĕr*, or VENTRIC'ULOUS, a. *-lŭs*, pertaining to a ventricle or small cavity; distended in the middle. VENTRIC'ULITE, n. *-līt*, in *geol.*, a fossil sponge of the chalk formation, usually appearing as a fungiform flint, well known to the inhabitants of Kent and Sussex in England as 'petrified mushrooms.' VENTRAL SEGMENT, in *music*, the segment or loop caused by the vibration of a string and where the amplitude of vibration is greatest; the points of rest between these segments are called *nodes*.

VENTRICULITES, *vĕn-trĭk'ū-līts:* genus of fossil siliceous sponges, frequent in cretaceous strata: they often form the nucleus around which flints are aggregated, and give their form to the flint-nodules. V. are sessile and cup-shaped, gradually opening from the base upward. Twelve species have been observed.

VENTRILOQUISM, n. *vĕn-trĭl'ō-kwĭzm*, or VENTRIL'OQUY, n. *-kwĭ* [L. *venter*, the belly; *loqui*, to speak]: the art or practice of speaking or uttering sounds which appear to come not from the person speaking but from some other, or from some unexpected place or direction. VENTRIL'OQUIST, n. *-kwĭst*, one who speaks in such a manner that his words appear as spoken by another near or distant. VENTRIL'OQUIZE, v. *-kwīz*, to speak as a ventriloquist. VENTRIL'OQUIZING, imp. VENTRIL'OQUIZED, pp. *-kwīzd*. VENTRIL'OQUOUS, a. *-kwŭs*, or VENTRILOQUIAL, a. *vĕn'trĭ-lō'-kwĭ-ăl*, of or pert. to ventriloquism.—*Ventriloquism* does not depend on any peculiar structure of the organs of voice, but on practice and dexterity, and consists mainly in taking a deep inhalation of breath, and then allowing it to escape slowly, the sounds of the voice being modified and muffled by means of the muscles of the upper part of the throat and of the palate, the ventriloquist availing himself at the same time of means such as are employed by sleight-of-hand performers to mislead the attention. The name V. is based on the popular but mistaken supposition that the sounds issued from the belly. V. is a very ancient art (see Is. xxix. 4). The Greeks ascribed it to the operation of demons, and called ventriloquists *Engastrimanteis* (belly-seers), also *Euryklytes*, from Eurykles, professor of the art at Athens.

VENTURE, n. *vĕn'tūr* [contr. from ADVENTURE]: an undertaking of chance or danger; a hazard; a speculation; the thing put to hazard; chance or fortune: V. to put or send on a venture or chance; to risk, to dare; to expose to hazard. VEN'TURING, imp.: N. the act of putting to risk or hazard. VEN'TURED, pp. *-tūrd* or *-chûrd.* VEN'TURER, n. *-tū-rĕr*, one who risks or puts to hazard. VEN'TURESOME, a. *-sŭm*, fearless; bold; daring. VEN'TURESOMELY, ad. *-lĭ.* VEN'TURESOMENESS, n. *-nĕs*, courage; daring. VEN'TUROUS, a. *-rŭs*, daring; bold; fearless. VEN'TUROUSLY, ad. *-lĭ*, daringly; fearlessly; boldly. VEN'TUROUSNESS, n. *-nĕs*, the quality of being venturous; boldness. AT A VENTURE, with the hope of a lucky chance; on chance; at hazard. TO VENTURE AT or UPON, to engage in with the mere hope of success.

VENTURINE, n. *vĕn'tūr-ĭn:* powdered gold used in japanning to cover varnished surfaces.

VENUE, n. *vĕn'ū* [mid. L. *visnētum;* Norm. F. *vesinė;* OF. *visnage*, neighborhood—from L. *vicīnus*, neighboring (see VICINAGE)]: in *law*, the neighborhood or county in which a wrong is committed, and in which it should be tried, and from which the jury must be drawn; the *venue* can now be changed on the consent of the court being obtained.

VENUE, *vĕn'ū:* same as VENEW (q.v.).

VENUS, n. *vē'nūs* [L. *Venus*, Venus—akin to Skr. *wan*, to conceive an affection for]: in *anc. myth.*, the goddess of beauty and love (see below); the planet second in distance from the sun (see below: also PLANETS: SOLAR SYSTEM): an old name for copper: a genus of mollusks of the family *Veneridæ* (q.v.).

VENUS, *vē'nŭs:* Roman goddess of Beauty and Love, especially of sensual love. Originally V. does not seem to have been conspicuous in the Latin religion, and scarcely figures in the history of Rome under the kings—a fact that throws some light on the Roman character, indicating the grave and serious disposition of the people, who highly valued matrimony and wedded joys, but cared little for the sentimental passion of love. Gradually, however, as the myth of the Trojan origin of Rome gained ground, the worship of V. emerged into importance. The Grecian Aphrodite was the mother of Æneas, and Aphrodite (q.v.) became V.; Ares was Mars, and Mars was the national god of the Roman people; and as, in the Greek mythology, Aphrodite was beloved of Ares, so, of course, V. was represented as the paramour of Mars, and thus was advanced by the poets to the dignity of the divine mother of the Roman people. Several temples were erected to her in Rome at different times and under different names; and her rites were celebrated in April—the springtime of the year being thought favorable to tender emotions.

The figure of V. was a favorite subject of ancient sculptors. One of the most famous specimens extant is the *Venus de' Medici*, preserved in the Uffizi Gallery at Florence, and generally admitted to be the finest relic of

ancient art. It was dug up in several pieces, either at the villa of Hadrian, near Tivoli, or at the portico of Octavia in Rome, in the 17th c.; and after remaining for some time in the Medici Palace in Rome (whence its name), was carried to Florence by Cosmo III., about 1680. It is a nude statue, 4 ft. 11½ inches in height without the plinth; and from the exquisite symmetry and grace of the figure, it has become a sort of standard of excellence for the female form. The sculptor was Cleomenes, the Athenian, B.C. 200. The beautiful *Venus of Milo* (correctly *Melos*), now in the Louvre at Paris, was found in the island of Melos 1820. Of modern statues the *Venus Borghese*, by Canova, in the Villa Borghese at Rome, is the most famous.

VE'NUS, in Astronomy: that one of the two inferior planets in the solar system which is nearer the Earth: see PLANETS: SOLAR SYSTEM. The mean distance of V. from the sun is 66,134,000 m.; mean distance of its orbit from the earth's orbit about 25,250,000 m. Its estimated diameter is 7,500 m., and its volume is in the ratio 171 : 200 to that of the earth. Its rotation period is estimated at 23 h. 21 m. 15 s. The mean sidereal revolution of V. is 224·7008 days; its mean synodical revolution 583·920 days. The spots or markings supposed by some astronomers to be visible on V. are rejected by competent observers armed with the best instruments. Says Sir John Herschel: 'The surface of V. is not mottled over with permanent spots like the moon; we perceive in it neither mountains nor shadows, but a uniform brightness, in which we may indeed fancy obscurer portions, but can seldom or never rest fully satisfied of the fact. It is from some observations of this kind that both V. and Mercury have been supposed to revolve on their axes in about the same time as the earth.' It is computed that in lat. 40°, either n. or s. in V., the temperature in midsummer is at least twice as high as in the same latitude on the earth: on the other hand, in mid-winter, when the sun does not rise above the horizon at all the cold must be as great as at the earth's poles in winter. The spectroscope shows that the atmosphere of V. contains water.

VENUSBERG, *vē'nŭs-bĕrg:* name of several mountains in Germany, especially in Swabia; it appears in Italy also. It occurs first, so far as known, in a poem, the *Children of Limburg*, composed in the Netherlands about 1337 (pub. by Van den Bergh, Leyden, 1846); but since then it appears frequently in the literature of the 15th and 16th c., and has been preserved to the present day in legends and popular songs. According to these accounts, the Lady Venus holds her court in the interior of such mountains, in brilliant style, with song and dance, banquets, and revels. Persons of earthly mold now and then visit her abode (they are represented always as *descending*), and tarry longer or shorter time, some even to the Day of Judgment, leading a life of perpetual delight; e.g., Heinrich von Limburg, a hero of the above-mentioned romance, and the noble Tannhäuser (q.v.) Yet they usually run the risk of eternal perdition; therefore the faithful Eck-

hart sits before the entrance of the mountain, and warns people against entering. The condition of the sojourners does not always present so enticing an aspect; for there are at times heard issuing from the mountain the lamentations of the damned; and Geiler von Keisersberg makes the witches in their night-expeditions rendezvous in the V. On putting together the various traits of these traditions, it is apparent that they originated in the mythology of the highest German antiquity. The Lady Venus is, under a name borrowed from the classical mythology, the universal Divine Mother of the old German belief, in her peculiar conception of Subterranean Goddess—the same being that appears under several other German names, each bringing forward some particular side of her character; e.g., Hulda (q.v.), the Gracious, Benign; Hilda, War; Berchta (q.v.), the Shining; Hel, the Concealed (from which the Eng. word Hell is derived). In this character of goddess of the under-world, she is surrounded by the elves and other subterranean spirits, unbaptized children, fallen heroes, and the wise women devoted to her services, who, in the way of thinking of later times, were degraded to witches. The queen of Elfland, or Faery, is evidently only another form of the Lady Venus modified by a more decided mixture of Celtic and classic elements.—See Tale of Tamlane, and Thomas the Rhymer, in *Minstrelsy of the Scottish Border*.

VE'NUS'S FLOWER-BASKET: see ZOOPHYTE.

VE'NUS'S FLY-TRAP: see DIONÆA.

VE'NUS'S LOOKING-GLASS: very pretty little annual (*specularia speculum*), of the order *Campanulaceæ;* long a favorite in flower-gardens, a native of corn-fields in s. Europe. It has brilliant blue, white, or violet-colored flowers, which fold up in a pentagonal manner toward evening.—In the United States the same name is applied to another species, *S. perfoliata*, common in open sterile ground; the toothed leaves roundish with clasping cordate base, with purple-blue flowers. A remarkable fact is that the earlier flowers are minute, and mature fruit precociously in the bud without expanding, thus having nothing to do with insect agency.

VERACIOUS, a. *vĕ-rā'shŭs* [L. *vērax* or *vērācem*, true —from *vērus*, true: It. *verace*]: observant of truth; habitually disposed to speak truth; true. VERA'CIOUSLY, ad. *-lĭ*. VERACITY, n. *vĕ-răs'ĭ-tĭ* [F. *véracité*]: habitual observance of truth; truthfulness; truth.

VERA CRUZ, *vā'râ krôss:* state of the republic of Mexico, bounded n.w. by San Luis Potosi, n. by Tamaulipas, e. by the Gulf of Mexico and the states of Tabasco and Chiapas; s.w. by Oajaca, w. by Puebla and Hidalgo; about 500 m. long, 80 m. broad; 27,433 sq. m.; cap. Jalapa. The surface is mountainous; traversed by the range of the Sierra Madre, but on the coast is a level strip about 30 m. wide. In V. C. is the great mountain Orizaba (q.v.), one of the highest elevations in America. It is a volcano, as are also two other mts. in V. C., viz.. the Cofre de Perote

and the San Martin. The mouths of the three chief rivers, the Panuco, the Alvaredo, and the Coatzacoalcos, are obstructed by bars. The coast-plain is highly insalubrious. In the interior the soil is very fertile. The products are sugar, coffee, tobacco, cacao, vanilla, cotton, cereals, and fruits. Cattle are raised in great numbers. The chief mineral products are gold, lead, copper, and iron. The state is divided into 18 cantons.—Pop. (1900) 960,570.

VERA CRUZ, or VILLA NEUVA DE LA VERA CRUZ, *vēl'yâ nwā'vâ dā lâ vā'râ krôss* (the New City of the Real Cross): fortified city and seaport on the e. coast of Mexico, about 263 m. by rail e. of the city of Mexico; with a pop. of a motley collection from many nations. The city is built in a semicircle facing the sea, and is regularly laid out; the streets, wider than is usual in tropical countries, running e. and w. from the harbor, with others crossing them at right angles. The town is well defended by a strong wall, and other substantial works, also by the castle of St. Juan de Ulloa on an island of the same name, about half a mile from the shore. The principal buildings are the cathedral, and about 15 other churches, generally built in the Moorish style, only six of which are in use; several monasteries; the court-house and prison, which stand on one side of the great square in the centre of the city. The houses and public buildings are generally of rubble masonry, formed of small stones, interspersed with red tiles, the whole afterward covered with good durable plaster, and variously tinted; and as most of the houses are in the old Spanish style, with open arcades, balconies, galleries, etc., the city presents a picturesque aspect. The drainage of the city flows down open channels in the centre of the streets, which are little above sea-level. This, combined with the poor water, which is all that the inhabitants can procure, the marshy and utterly barren country around, and the pestilential climate, accounts for the frightful ravages of yellow and other fevers. Yellow fever is most prevalent from May to Nov. Although V. C. is the chief port for all Mexico, it had for years no proper harbor, but only an open roadstead between the town and the castle. The anchorage was exceedingly poor; when the north gales, or *Nortes* (terrible hurricanes, bearing clouds of sand from the sand-hills behind the town), prevailed many vessels were wrecked on the adjoining shore. But the harbor has been improved by a breakwater and is safer, though not commodious. Railways connect V. C. with Mexico, with Acapulco (passing through Jolapa and Purpla) and with other cities. Tramways also extend through the principal street to the railway station, 2½ miles.

The chief exports are the precious metals, cochineal, sugar, flour, indigo, provisions, sarsaparilla, leather, vanilla, jalap, soap, logwood, and pimento; imports, cotton, woolen, linen, and silk goods, brandy, iron, steel, wax, quicksilver, paper, hardware and cutlery, earthenware, etc. The exports from V. C. 1886 (one-half of all exports from Mexico) had a value of about $15,000,000—one-third being gold and silver: imports 1886 about

$9,400,000. In 1890 the entrances at the port were 295 vessels of 473,704 tons, and the clearances were about the same; and the exports to the United States amounted in gold to $4,333,027.—OLD VERA CRUZ, a village northward, was the first Spanish settlement on the coast.—Pop. of V. C. (1884) 16,840; (1889) 24,000.
of V. C. (1884) 16,840; (1889) 24,000; (1900) 24,085.

VERANDA, n., or VERANDAH, n. *vĕ-răn'dă* [Port. *varanda*, a balcony, a terrace—from Skr. *varanda*, a portico]: a kind of open portico, or light gallery, sometimes latticed, attached to a building on one or more sides, the roof being supported on pillars; popularly but erroneously called *piazza* in the United States.

VERATRIA, n. *vē-rā'trĭ-ă*, or VERA'TRINE, n. *-trĭn*, and VERATRINA, n. *vĕr'ă-trī-nă* [L. *vērātrum*, the plant hellebore]: a vegetable alkaloid, obtained from the root-stocks of plants of the genus *Vērātrum*, generally in the form of a white crystalline powder, very acrid and poisonous. VERATRUM, n. *vē-rā'trŭm*, a genus of plants, one of which is *white hellebore*, or *Vērātrum album*, ord. *Melanthācĕæ* (see HELLEBORE). VERA'TRIC ACID, the acid found with veratria in the genus of plants *Veratrum*.—*Veratria* occurs in cevadilla (the dried fruit of *Asagræa officinalis*), in the bulbs of *Colchicum autumnale*, and in roots and seeds of different species of *veratrum*. Cevadilla is the source from which it is most readily obtained (see the Pharmacopœia). In a state of purity, it is a pale, gray, amorphous powder, without smell; but even in the most minute quantity, powerfully irritating to the nostrils, sometimes producing dangerous fits of sneezing. It is strongly and persistently bitter, and highly acrid; insoluble in water, sparingly soluble in spirit and ether, but readily in diluted acids. Heated with access of air, it melts into a yellow liquid, and at length burns away, leaving no residue. In France, it is much used as an internal remedy for pneumonia and acute rheumatism, and for the latter its efficacy is well established. It is given in the form of pills, containing $\frac{1}{14}$ of a grain, of which three may at first be given daily, and the number increased to eight or ten, unless pain in the throat or stomach, vomiting, or diarrhea supervene, when their use must be suspended till these symptoms disappear. In some other countries it is used chiefly in external application as 'ointment of veratria' for neuralgic affections, and for scrofulous diseases of the joints. It is an extremely violent poison, and must be prescribed and used only under professional advice.

VERAZZANO, *vā-râ-tsâ'no* (or VERRAZANO, *vĕr-râ-tsâ'no*), GIOVANNI DA: navigator: 1470–1525; b. near Florence. He entered the French maritime service at an early age, and in French annals is credited with visiting the n. coast of America 1508. Thereafter for years he was a corsair, ravaging the Portuguese and Spanish settlements in the E. and W. Indies: his most valuable prize was the treasure-ship that was carrying to Spain the spoils of Mexico. In command of a French frigate, he explored the coast of N. America, n. lat. 30°—50°, 1524; made a landing near Cape

Fear, and discovered the New York Bay and Narragansett Bay. He landed on Newfoundland, and raised the royal standard of France there in token of French occupation; then he sought the n.w. passage. On his return to France he submitted to the king, Francis I., an account of his voyage. The remainder of V.'s life is involved in obscurity. According to one account he was assassinated by aboriginals in Newfoundland during a second visit to that island; another account identifies him with 'Juan Florin,' taken by the Spaniards on the s. coast of Spain, and executed as a corsair.

VERB, n. *vĕrb* [F. *verbe*—from L. *verbum*, a word: It. *verbo*]: in *gram.*, a word which asserts or declares; the part of speech which affirms, or which in general tells what a person or thing does or suffers; in *OE.*, a word. VERBAL,, a. *vĕrb'ăl* [F.—L.]: not written; uttered by the mouth; relating to words only; minutely exact in words; literal; in *gram.*, derived from a verb; in *OE.*, full of words; verbose. N. in *gram.*, a noun derived from a verb, e.g., *hanging* from 'hang,' *washing* from 'wash.' VERB'AL-NOTE, n. in *diplomacy*, an unsigned memorandum or note when an affair has continued for a long time without any reply. It is designed to show that the matter though not urgent has not been overlooked. VERB'ALLY, ad. *-lĭ*, by words uttered; orally. VERB'ALISM, n. *-ĭzm*, something expressed orally. VERB'ALIST, n. *-ĭst*, one who deals or is skilled in words; one who is minutely exact, or criticises by words. VERB'ALIZE, v. *-īz*, to convert into a verb; to use a superabundance of words. VERBATIM, ad. *vĕr-bā'tĭm* [L.]: word for word; in the same words; in *OE.*, orally. VERBIAGE, n. *vĕr'bĭ-āj* [F. *verbiage*]: superabundance of words; empty discourse. VERBOSE, a. *vĕr-bōs'* [L. *verbōsus*, wordy]: using or containing more words than are necessary; wordy; prolix. VERBOSE'LY, ad. *-lĭ*. VERBOSITY, n. *vĕr-bŏs'ĭ-tĭ*, or VERBOSE'NESS, n. *-nĕs*, employment of a superabundance of words; the use of more words than are necessary. ACTIVE VERB, a verb in which the action passes directly to an object, as, 'John *struck* the dog.' CAUSATIVE VERB, a verb the action of which is caused by the subject, as, 'I *ran* the knife into my hand.' FREQUENTATIVE VERB, a verb denoting a frequent repetition of the action. IMPERSONAL VERB, a verb used only in the 3d pers. singular, as, 'It rains,' 'It snows.' INTRANSITIVE VERB, a verb whose action is confined to the subject, as, 'I sleep,' 'I run,' 'The sun shines.' NEUTER VERB, same as INTRANSITIVE VERB. TRANSITIVE VERB, a verb which carries the action from the subject to an object, as, 'The girl cooked the food.' PASSIVE VERB, a verb in which the object becomes the subject, as, 'The *bear* was slain by the hunter' (passive) = 'The hunter slew the *bear*' (active).

VERB: that part of speech which predicates or affirms, and is consequently the instrument by which the mind expresses its judgments. No thought can be fully expressed without it: thus it is the most important word in a sentence, and is appropriately called 'verb,' or *the word.* See GRAMMAR: SENTENCE: PARTS OF SPEECH. Verbs affirm either some action or some state; as, 'John *reads,*' 'The sun *shines.*' 'The book *lies* on the table.' When the nature of the action requires an object to complete the sense, the verb is called *Transitive,* because the action *passes over* to an object; as, 'The child strikes *the dog.*' Some verbs complete the conception of the action in themselves, and require no complement; as, 'The child *sleeps,*' 'The bird *flies*': these are called *Intransitive.* A distinction is sometimes made between intransitive verbs expressing action (as *flies, moves*) and intransitive verbs expressing a state (as *sleeps, lies*), the latter being called *neuter* verbs: but it is often impossible to draw the line where activity ends and neutrality begins. Even in such a verb as *sleeps,* it is implied that the sleeper shows certain outward manifestations that act or make an impression on the beholder; when we affirm that an object *stands, lies,* or even *exists,* or *is,* we in fact affirm that it 'acts,' in this sense. All verbs, thus, agree in affirming action.

Nor can any exact or permanent division be made into transitive and intransitive. We can say whether a given verb in a particular sentence is used transitively or intransitively; but not that it is in itself transitive or intransitive. It would be difficult to find a verb that cannot be shown to be both transitive and intransitive—e.g., in 'He *broke* the glass,' *broke* is transitive, while in 'The glass *broke*' the same word is intransitive. 'The child *sees* the candle,' is an instance of a transitive verb; in 'The new-born child *sees,* but the puppy is blind,' the same verb is intransitive. A verb used transitively has reference to particular acts; when the action is to be *generalized,* all specification of an object is dropped, and the verb becomes intransitive—e.g., 'Men *build* houses' (trans.); 'Men *build,* and time pulls down' (intrans.).

An intransitive verb generally expresses a kind of action that we think of as composed of a number of parts, all like one another; as, 'He *walks, runs.*' Now, with regard to the particular parts, we generally find that the same verb takes an object after it; as, 'He walks *a step, a mile, a long way,*' 'John played *a stroke, a piece, a game,*' 'He did not sleep *a wink*' (sleep being a prolonged winking): and any intransitive verb can take its cognate noun as an object—e.g., 'He *ran* a *race,*' 'They *died* an easy *death,*' 'Let me *die* the *death* of the righteous,' 'They *slept* the *sleep* that knows no waking.' In these cases, *step, mile, race, death, sleep.* are used adverbially; and *walk, ran, died, slept,* are still intransitive verbs.

From certain intransitive verbs, a class of transitive verbs called *causative verbs* may be formed, as in the following table:

Intransitive.	Transitive	
He sits.	He sets	(causes to sit).
" lies.	" lays	(" " lie).
" falls.	" fells	(" " fall).
" rises.	" raises	(" " rise).
" sucks.	" soaks	(" " suck).
" drinks.	" drenches	(" " drink).
" dives.	" dips	(" " dive).

In the ancient forms of our language there were many more such causative verbs, formed from root-verbs by a change, generally of the vowel. In Hebrew, every verb is capable of assuming the causative form. Modern English does not stand much on forms, but employs almost any verb in a causative sense without change of any kind: thus, 'The horse *walked*'—'the groom *walked* the horse;' 'The wood *floated*'—'raftsmen *floated* the wood down the stream.'

One class of intransitive verbs become transitive by addition of a preposition; as *speak—speak to*, *fall—fall upon*. Some verbs already transitive take prepositions simply to modify the sense; as *set—set up*, *break—break down*. In such cases the verb and preposition are to be considered as forming one compound verb, and might be written with a hyphen—speak-to, break-down. When a verb has no grammatical subject, or is used with the third person only, it is said to be *impersonal;* as *methinks; it rains; it snows.*

The verb affirms action or existence of a subject under certain conditions or relations called *voice, mood*, and *tense*. In synthetic languages, such as Latin, Greek, or Sanskrit, these conditions or relations are indicated by modifying suffixes appended to the root of the verb. In the Latin *reg-er-e-mu-s*, e.g., *-er* is added to the stem *reg-* as the sign of past time; to this *e* is added as the sign of mood, *mu-* as the sign of the first person, and lastly *s* as a plural sign denoting others with the person speaking. There are two *voices:* the *active*, in which the subject of the verb is represented as acting; and the *passive*, in which the subject of the verb is represented as affected by the action. Instead of 'Cæsar *defeated* Pompey,' we may say, 'Pompey *was defeated* by Cæsar:' in the former, the verb is in the *active voice;* in the latter, in the *passive voice*. In using the passive voice, the thing or person acted upon is made the subject of the sentence, and has the chief attention directed to it; with the active voice, the doer and his action are more prominent. Only transitive verbs can have a 'passive' voice; yet by the addition of a preposition some intransitive verbs become capable of being used in the passive voice: thus, 'The king spoke to the duke about it'—'the duke was spoken to about it by the king;' 'Robbers fell upon him'—'he was fallen upon by robbers.'

In English the passive voice is expressed by the passive participle combined with an auxiliary verb—i.e., such verbs as *be, do, will, have, may*, which aid in forming the moods and tenses of principal verbs: see CONJUGATION. A verb with a passive form but an 'active' meaning is

called a *deponent* verb (see DEPONE). When the subject and object of a verb are the same, the verb is called *reflexive*, or 'self-affecting,' because the action asserted by it turns back upon the subject itself, or has for its object a pronoun representing the subject; as, 'I remember me,' 'I bethought me.' In modern English, 'self' is added to the pronoun to indicate this reflexive meaning, though personal pronouns are sometimes used as they were in Old English—e.g., 'I lay *me* down to sleep.'

Mood is the mode or manner in which action is presented or regarded. Strictly there can be only two moods: (1) the *indicative*, which directly asserts that action is taking place, has taken place, or will take place; as, 'I go,' 'I will go;' (2) the *subjunctive* or indirect mood, which asserts the possibility or supposition of the action taking place, in past, present, or future time; as, 'If I go,' 'I may go:' this is called the *hypothetical*, and sometimes the *conditional* or *conjunctive* mood. The *indicative* mood simply asserts; the *subjunctive* implies uncertainty, or dependence on something else. Besides these moods, grammarians mention others. If action is commanded, we use the *imperative* mood—e.g. '*Go ye;*' but if we state what the action *is* without limitations of any kind as regards voice, time, etc., we use the *infinitive* mood. This, however, is now generally regarded as no mood at all, but simply an abstract noun; and the imperative as only a verbal interjection.

Tense expresses the relation of the action asserted by the verb to the subject as regards time. There are three *tenses:* past, present, future. Each of these may be regarded as *simple*, as *completed*, as *progressive*, or as *inceptive*.

Thus we have:

I. SIMPLE TENSES.

Past	act.	I loved.
	pass.	I was loved.
Present	act.	I love.
	pass.	I am loved.
Future	act.	I shall love.
	pass.	I shall be loved.

II. COMPLETED OR PERFECT TENSES.

Past Perfect (or *Pluperfect*)	act.	I had loved.
	pass.	I had been loved.
Present Perfect (or simply *Perfect*)	act.	I have loved.
	pass.	I have been loved.
Future Perfect	act.	I shall have loved.
	pass.	I shall have been loved.

III. PROGRESSIVE OR IMPERFECT TENSES.

Past Imperfect	act.	I was loving.
	pass.	I was being loved.
Present Imperfect	act.	I am loving.
	pass.	I am being loved.
Future Imperfect	act.	I shall be loving.
	pass.	I shall have been loved.

IV. INCEPTIVE TENSES.

Past Inceptive	act.	I was going to love.
	pass.	I was going to be loved.
Present Inceptive	act.	I am going to love.
	pass.	I am going to be loved.
Future Inceptive	act.	I shall be going to love.
	pass.	I shall be going to be loved.

Verbs may be classified according to their meaning, as *causative, inceptive, frequentative, desiderative, factitive,* etc.; according to their origin, as *primitive* or *derivative;* and according to their form, as *regular* or *irregular, redundant,* and *defective.* In English a verb is said to be regular when it forms its past tense and perfect participle by adding *-d* or *-ed* to the present—e.g., *love, loved, loved;* and irregular when these parts are formed in some other way, as by change of the stem vowel—e.g., *drink, drank, drunk.* The former are called *weak* verbs, and the latter *strong* verbs (see CONJUGATION). A verb is *redundant* when the past tense or perfect participle has more than one form; and *defective* when used in only some tenses or moods.

VERBENA, n. *vĕr-bē'nȧ* [L. *verbēnæ,* branches of laurel or myrtle]: genus of ornamental plants, cultivated for their beauty or for their delightful odor, ord. *Verbenăcĕæ* (q.v.); a plant of this genus; the vervain: the verbenas of gardens are chiefly the varieties *V. chamædrĭfolia* or *V. officinālis.*

VERBENACEÆ, *vĕr-bē-nā'sē-ē:* natural order of exogenous plants, chiefly trees and shrubs, though in part herbaceous plants. The leaves are generally opposite and simple, and have no stipules. The flowers are generally in corymbs or spikes; the calyx is tubular, persistent, inferior; corolla hypogynous, tubular, its limb usually irregular; stamens generally four, two long and two short, sometimes equal—sometimes only two; ovary 2–4-celled, style solitary, terminal; fruit composed of 2–4 achenia united, sometimes fleshy; seeds 1–4. The order contains almost 800 known species, chiefly tropical, some of them natives of temperate countries. The V. are allied to *Labiatæ* both in botanical characters and in properties; but the leaves have no oil-glands. Some are beautiful ornaments of flower-gardens and hot-houses; some are highly esteemed for fragrance; some are used in medicine, e.g., Vervain (q.v.), etc., though no medicinal plant of much value belongs to the order; the fruit of some species, e.g., *Premna esculenta* and species of *Lantana,* is eaten; the leaves of *Stachytarpheta Jamaicensis* are used as substitute for tea; and the timber of a number of species is valuable. To this order belongs the Teak (q.v.) of India.—Of the United States representatives of this order, besides Vervain (q.v.), there are the Fog-fruit (*Lippia*), the shrubby so-called French Mulberry (*Callicarpa Americana*), and the Lopseed (*Phryma*).

VERBOECKHOVEN, *vĕr-bûk'ho-vĕn*, EUGENE JOSEPH: painter: 1799, June 8—1881, Jan. 21; b. Warneton, Belgium. He was a pupil of his father, a sculptor, in drawing and modelling. His *Cattle Market at Geneva*, exhibited in Brussels 1821, established his reputation as a promising animal-painter; his greater work, *A Herd of Cattle in an Autumn Landscape*, was bought by Baron James de Rothschild for $10,000. Other great paintings by him are: *A Flock of Sheep overtaken by Storm; A Herd of Cattle in the Campagna; Horses attacked by Wolves.* He published several vols. of etchings.

VERCELLI, *vĕr-chĕl'lē:* venerable city of n. Italy, prov. of Novara; in a fertile plain, on the right bank of the Sesia; 44 m. w.s.w. of Milan by railway. It covers a wide area, is surrounded by boulevards—those on the n.w. commanding a magnificent view of the Alps—is the seat of a bishop, and has the appearance of great prosperity. The cathedral, an edifice of about the middle of the 16th c., has a library containing a collection of ancient and valuable MSS. V. is a thriving commercial city.—Pop. (1881) 20,165.

VERDANT, a. *vĕrd'ănt* [F. *verdoyant*, verdant; *verd*, green—from L. *virĭdis*, green: It. *verde*, green]: green; covered with growing grass or plants; fresh; flourishing; soft; raw; inexperienced. VER'DANTLY, ad. *-lĭ.* VER'DANCY, n. *-dăn-sĭ*, greenness; inexperience. VER'DURE, n. *-dūr* [F. *verdure*—from *verd*, green]: greenness; the fresh color of vegetation. VER'DURED, a. *-dūrd*, covered with verdure. VER'DUROUS, a. *-dūr-ŭs*, green; decked with green.

VERD-ANTIQUE, n. *vĕrd'-ăn-tēk'* [F. *verd*, green; *antique*, ancient]: beautiful green variety of marble, consisting of an aggregate of serpentine and limestone irregularly intermingled.—Oriental *Verd-antique* is a green porphyry, its base dark-green felspar, with dispersed crystals of greenish-white felspar. Beautiful specimens have been found in this country. The name has been given also to Serpentine (q.v.) clouded and veined with gray or whitish limestone, as in a quarry near New Haven, Conn., and in another in Newbury, Mass. V.-A. was much prized by the ancient Romans, and is still in great favor in Italy.

VERDEN, *fĕr'dĕn:* town of Prussia, former cap. of a duchy; in Hanover, on the right bank of the Aller, here crossed by a bridge; 42 m. by railway n.n.w. from Hanover.—Pop. (1880) 8,553.

VERDERER, n. *vĕr'dĕr-ĕr*, or VER'DEROR, n. *-ŏr* [F. *verdier*, a verderer—from *verd*, green—from L. *virĭdis*, green]: *formerly*, a royal officer employed to look after the vert or every green growing thing in the forest, and maintain the assizes of the forest, etc.

VERDI, *vĕr'dē*, GIUSEPPE: noted Italian operatic composer: b. 1813, Oct. 9, at Rancola, duchy of Parma, where his father kept an inn. He received his musical education at Milan (1833–36). His first work was a musical drama, *Oberto di San Bonifazio* (1839). Since then he has produced a number of operas, including *I Lombardi; Ernani* (1844); *Giovanna d'Arco* (1845); *Attila* (1846); *Macbeth* (1847); *Rigoletto* (1851); *Il Trovatore* (1853); *La Traviata* (1853); *Un ballo in Maschera* (1859); *La Forza del Destino* (1862); *Don Carlos* (1867); *Aïda* (1870); *Montezuma* (1878); and *Otello* (1887). V.'s operas, while they abound in pleasing melody and in striking dramatic effects, are characterized by noisy orchestration. In 1861 he was elected to the Italian parliament, and 1874 was made a senator; 1875 he was nominated a commander of the French Legion of Honor, of which he was already a member. He is a member of many artistic societies, and has been decorated by the emperor of Russia, the emperor of Austria, the khedive of Egypt, etc. He died 1901, Jan. 27.

VERDICT, n. *vĕr'dĭkt* [OF. *verdit;* F. *verdict*—from L. *vērum dictum*, a true saying or utterance; *vērus*, true; *dictus*, pp. of *dicĕrĕ*, to say]: the answer given to the court by a jury on any matter committed to them for examination; a decision; opinion pronounced, as the *verdict* of public opinion. The usual *Verdict* in criminal cases is 'guilty' or 'not guilty;' in civil cases it is a V. for the plaintiff or for the defendant, according to the fact: these are called general verdicts. In some civil cases the jury, when doubtful, or when the court directing them is doubtful how the law ought to be applied to the facts, find a special V., i.e., specific facts, leaving the court to draw the proper conclusion. In criminal cases they may find a special V., but are not obliged to do so. Courts have, in general, power to grant or refuse at discretion a new trial after a jury has rendered a V.: in some cases the law recognizes the right of a person convicted of crime to have a new trial. But a person acquitted of a criminal charge by the V. of a jury cannot lawfully be put on trial again for the same offense, unless acquittal has been procured by his own fraud or evil practice. The grounds for setting aside a V. and granting a new trial are many—e g., failure to give defendant due notice of time and place of trial; irregularity in the procedure of court officers; prejudicing the jury; misconduct of the jury; error of the judge; discovery of new evidence; excessive damages; the fact that the V. is against the law; obscurity of the verdict.

VERDIGRIS, n. *vĕr'dĭ-grĭs* [F. *verd-de-gris*—seemingly from its form a combination of *verd*, green, *de*, of, and *gris*, gray; more probably a corruption of OF. *verderis;* mid. L. *vĭrĭdĕ æris*, verdigris—from L. *vĭrĭdis*, green; *æs*, brass]: a rust of copper or one of its compounds, so called from its peculiar green color; a bluish-green pigment prepared from verdigris, obtained by subjecting copper to the action of a vegetable acid. VERDIGRIS-GREEN, deep green with a mixture of blue.—*Verdigris* or diacetate of copper, $Cu(C_2H_3O_2)_2.2CO + (H_2O)_3$, is largely used for commer-

cial purposes, and for external application in surgery. It is prepared on a large scale by piling up copper-plates with alternate layers of marc or fermenting grape-skins. In a few weeks the surface of the copper is covered with a crust of the salt, which is detached, made into a thick paste with vinegar, and pressed into molds. The salt thus obtained is in the form of a bluish-green tough mass, not easily pulverized. The formation of the salt by this process is due to the alcohol in the grape-skins being slowly oxidized into acetic acid, while the copper absorbs oxygen from the air, and the oxide thus formed unites with the acetic acid. V. may be obtained more directly by placing the copper sheets in cloths dipped in vinegar. V. is permanent in the air; when heated, it loses first water, then acetic acid, the residue being metallic copper. Water resolves it into an insoluble tribasic acetate and a soluble subsesquiacetate of copper—which must be recollected in employing this salt. It is used by the surgeon as a caustic application to venereal warts and fungous growths; it is a good application in ophthalmia tarsi, and has been of service in stimulating old and indolent ulcers, in the ulcerated sore throat of scarlatina, and in malignant ulcer of the tongue. It may be used in the form of an ointment or a liniment. The latter, formerly known as *Mel Ægyptiacum*, is composed of 1 ounce of powdered V., 7 ounces of vinegar, and 14 of honey: the V. is dissolved in the vinegar, and to the strained solution the honey is added, and the whole is boiled to a proper consistence. It should be applied with a camel-hair pencil.

V. is an active irritant poison, and accidents from it are not rare, as it is often formed in copper vessels used for cooking, or through the very reprehensible practice of putting copper coins into pickles to give them a fine green color. If copper vessels for cooking are kept perfectly clean, they seem not to be dangerous, provided (1) no acid matter be placed in them; (2) that the boiled materials are at once poured out, and not allowed to stand to cool in them; (3) that the vessels are always at once cleaned. But the interior of copper vessels should always be tinned, care being frequently taken that the tinning remains entire. In cases of poisoning, the best treatment is free administration of white of eggs and milk.

VERD ISL'ANDS: see CAPE VERD ISLANDS.

VERDITER, n. *vėr'dĭ-tėr* [F. *verd-de-terre*, the green of earth]: blue or green pigment obtained by adding finely levigated chalk or whiting to a solution of copper in nitric acid, and extensively used in house-painting. Green V. is generally known as Bremen Green. It is formed by a very complicated process from blue vitriol, or sulphate of copper, sea-salt, metallic copper, muriatic acid, caustic potash, and water; and occupies three months in its manufacture. The blue is most valued.

VERDOY, n. *vėr'doy* [OF. *verdoyer*, to put forth leaves, become green—from *verd*, green]: in *her.*, term applied to a bordure charged with flowers, leaves, or other vegetable forms.

VERDUN, *vĕr-dŭng'*: strongly fortified town of France, dept. of Meuse; on the right bank of the river Meuse; about 150 m. (direct line) e.n.e. of Paris; 174 m. by rail. It was fortified by Vauban (q.v.); and its defenses consist of a wall with bastions, and a citadel which stands on the left bank of the river, on the site of the old Abbey of St. Vannes, dating from the 13th or 14th c. V. is the seat of a bishop, has a fine cathedral (11th and 12th c.), and carries on various manufactures. At the time of the Roman conquest V. (anc. *Verodunum*) was an important town. It was conquered by Germany in the 10th c.; taken possession of by Henry II. of France 1553; and definitely became French by the treaty of Westphalia, 1648. In 1871, Nov., it was taken by the Germans, who thus established better communication between Germany and their troops before Paris.—Pop. (1886) 17,282.

VERDURE, VERDUROUS: see under VERDANT.

VERESTCHAGIN, *vā-rĕs-chä-gēn'*, or WERESCHTSCHAGIN', VASILI VASILIEVITCH: painter: b. in the govt. of Novgorod, Russia, 1842, Oct. He studied in the marine school at St. Petersburg, but at the age of 17 began his career as an artist, earning his livelihood as a schoolmaster till 1861, when his father, convinced that the youth had natural gifts for art, gave him the means of foreign travel. V. pursued his art studies in Berlin and Paris. He accompanied Gen. Kaufmann to Turkestan 1867; in Samarcand he showed great bravery and military resource in a fierce encounter with insurgents. 1870–73 he studied and worked in Munich; then erected in Paris the immense studio in which he painted his colossal pictures. He quitted his art at the summons of the Grand Duke Nicholas to join the army under Gen. Skobelef, and served with highest distinction through the Russo-Turkish war: afterward he transferred to canvas some of the most memorable scenes of that war. His paintings are sternly—some of them even frightfully—realistic: he paints war as it is, not war idealized or conventionalized. His works are very numerous, and most of them colossal. A collection of them was exhibited in New York and in Chicago 1888–9.

VERGE, n. *vĕrj* [F. *verge*, a rod or twig, the wand borne by an officer as a sign of his authority—from L. *virga*, a rod, a twig]: a rod, wand, or staff, carried as an emblem of authority; a mace, as of a bishop or other functionary; the stick or staff which a tenant held in his hand while swearing fealty to his lord; the limits within which the authority of an officer or court extends, as the verge of a court; the extreme side or end of anything; edge; utmost border; margin; the grass edging of a garden-bed, etc.; a mediæval term for the shaft of a column; in a *watch* [F. *verge*, a plain hoop ring]: the balance-wheel, distinguished from the others by the absence of cogs; in *OE.*, circle or ring. VERGER, n. *vĕr'jĕr*, a wand-bearer; the officer of a court who carries the sword or mace; an officer connected with a cathedral or collegiate church who carries the mace, before the dean or other chief dignitary, in procession, or

on any other ceremonial occasion. ROOM AND VERGE, space and margin. VERGE-BOARD: see BARGE-BOARD.—SYN. of 'verge': brim; rim; brink; limit.

VERGE, v. *vĕrj* [L. *vergĕrĕ*, to turn, to incline]: to bend; to tend; to approach. VERG'ING, imp. VERGED, pp. *vĕrjd*. VERGENCY, n. *vĕr'jĕn-sĭ*, approach; tendency; inclination.

VERGIL'IUS (PUBLIUS VERGILIUS MARO): see VIRGIL.

VERGNIAUD, *vĕr-nyē-ō'*, PIERRE VICTURNIEN: revolutionist: 1759, May 31—1793, Oct. 31; b. Limoges, France. He was a lawyer in large practice at Bordeaux when the French Revolution broke out, and supported the popular cause with enthusiasm. Elected member of the legislative body 1791, he became its vice-pres. Oct. 16, and pres. Oct. 31. Every law proposed for the enforcement of severe measures against the emigrant nobles was zealously advocated by V.; he also promoted the proclamation of the republic. He became member of the national convention 1792, and in that body at first favored the proposition to refer to the people the decision of the fate of the king; but that proposition having been rejected, V. voted for immediate execution, and as pres. of the convention himself pronounced sentence of death on Louis. Till the downfall of the Girondists, 1793, June 2, V. was the most brilliant leader of that party, and was the persistent opponent of Robespierre and the *montagnards*. Summoned to meet the charge of treason, he with his friends appeared before the revolutionary tribunal Oct. 24, and made an eloquent and spirited defense; but he and his colleagues were sentenced to death, and V. was guillotined Oct. 30. His life was written by Touchard-Lafosse—*Histoire parlementaire et vie intime de Vergniaud.*

VERIDICAL, a. *vĕr-ĭd'ĭ-kăl* [L. *vērus*, true; *dicĕrĕ*, to say]: observant of truth; veracious.

VERIFY, v. *vĕr'ĭ-fī* [F. *vérifier*, to verify—from L. *vērus*, true; *facĭō*, I make]: to prove to be true; to make good; to confirm by argument or evidence; in *OE.*, to declare; to sustain. VER'IFYING, imp. VER'IFIED, pp. *-fīd*. VER'IFIER, n. *-fī-ĕr*, one who or that which verifies. VER'IFIABLE, a. *-ă-bl*, that may be proved or confirmed by evidence. VER'IFICA'TION, n. *-fĭ-kā'shŭn*, the act of proving to be true. VER'IFICA'TIVE, a. *-tĭv*, tending to confirm.

VERILY, ad. *vĕr'ĭ-lĭ*: see under VERY.

VERISIMILAR, a. *vĕr'ĭ-sĭm'ĭ-lĕr* [L. *vērus*, true; *simĭlis*, like]: having the appearance of truth; likely. VER'ISIMIL'ITUDE, n. *-sĭ-mĭl'ĭ-tūd* [L. *similĭtūdo*, likeness]: the appearance of truth; probability; a statement having the guise of probability.

VERITY, n. *vĕr'ĭ-tĭ* [F. *vérité*—from L. *verĭtas* or *verĭtātem*, truth—from *vērus*, true]: truth; a true assertion or tenet; moral truth; agreement of the words with the thoughts. VER'ITABLE, a. *-tă-bl*, agreeable to fact; true. VER'ITABLY, ad. *-blĭ*.

VERJUICE, n. *vėr'jūs* [F. *verjus*—from *verd* or *vert*, green; *jus*, juice]: the juice extracted from green or unripe fruit; an acid liquor expressed from unripe grapes, wild apples, etc.; tartness; sourness.

VERMEIL, n. *vėr'mĭl* [F. *vermeil*, lively red, vermilion—from mid. L *vermic'ŭlus*, scarlet color (see VERMILION)]: a brilliant red; vermilion; a liquid mixture used in gilding; the name given by jewellers to crimson-red garnet inclining slightly to orange.

VERMEJO, *vĕr-mā'cho:* affluent of the Paraguay (q.v.).

VERMES, n. plu. *vėr'mēz* [L. *vermis*, a worm]: worms; name given by Linnæus to the last of the six classes of his zoological system, in which he included all the lower invertebrate animals, whether of worm-like form or not, which he had found no place for in the five other classes—viz., Mammalia, Aves, Amphibia, Pisces, Insecta.

VERMICELLI, n. *vėr'mĭ-chĕl'lĭ* or *-sĕl'lĭ* [It. *vermicelli*, rolled or worm-like paste—from *vermicello;* L. *vermic'ŭlus*, a little worm—from *vermis*, a worm]: a stiff paste or dough of fine wheat-flour made into long, slender, wormlike threads, twisted in small bundles or coils and dried, for the preparation of which Naples is especially famous; a fine kind of *Macaroni* (q.v.), from which it differs in being solid, and not tubular or hollow. It is used in soups, etc.

VERMICULAR, a. *vėr-mĭk'ū-lėr* [L. *vermic'ŭlus*, a little worm—from *vermis*, a worm]: pertaining to or resembling a worm; shaped like a worm. VERMIC'ULATE, v. *-lāt*, to inlay in a manner to resemble the motions or the tracks of worms. VERMIC'ULATING, imp. VERMIC'ULATED, pp. a. disposed in wreathed lines like the undulations of worms, as in *vermiculated work*. VERMIC'ULA'TION, n. *-lā'shŭn*, the act or operation of moving in the form of a worm, as in the peristaltic motion of the intestines; the act of so forming or inlaying as to resemble the motion of a worm; checkering or cancelling formed in mason-work as an ornament, giving the appearance of being eaten by worms. VERMICULE, n. *vėr'mĭ-kūl*, a little worm; a grub. VERMICULOSE, a. *vėr-mĭk'ū-lōs*, or VERMIC'ULOUS, a. *-lŭs*, full of or resembling worms. VERMIC'ULITE, n. *-ū-līt* [Gr. *lithos*, a stone]: a mineral resembling talc in appearance, having a granular scaly structure, the scales of which, when highly heated, separate into worm-like threads. VERMIC'ULITES, n. plu. *-līts*, in *geol.*, the smaller and shorter worm-tracks which appear on the surfaces of many flaggy sandstones. VERMIFORM, a. *vėr'mĭ-fawrm* [L. *forma*, shape]: twisted or shaped like a worm or its motions; wormlike in form.

VERMIFORM APPENDIX: see APPENDIX VERMIFORMIS.

VERMIFUGAL, a. *vėr-mĭf'ūgăl* [L. *vermis*, a worm; *fugārĕ*, to drive away]: tending to prevent or destroy worms, or to expel them; of the nature of a vermifuge. VER'MIFUGE, n. *vėr'mĭ-fūj*, a medicine that dislodges and expels intestinal worms; an anthelmintic.

VER'MIFUGES, or VER'MICIDES, or ANTHELMINTICS: remedies which possess the property of dislodging and expelling intestinal worms, or of destroying them. *Vermifuges* dislodge and expel; *vermicides* kill; *anthelmintics* is a general term, including all remedies without reference to their mode of action. The only worms whose presence in the intestinal canal is so common that the remedies for their destruction and expulsion require special notice, are the two varieties of tapeworm known as *Tænia solium* and *Tænia mediocanellata*, or the *hooked* and the *hookless Tapeworm* (q.v.); the *Ascaris lumbricoides*, or *large round worm;* and the *Ascaris* or *Oxyuris vermicularis*, or *small threadworm.* Some anthelmintics are said to be useful remedies as regards all three kinds of worms. Among them are *Absinthium*, or *wormwood*, whose effects are doubtful; *Sabadilla*, or *Cevadilla; Santonica*, or *worm-seed*, and its active principle, *Santonin* (q.v.); and *Oil of Turpentine.* The remedies that have been recommended in tapeworm, ranging them according to the repute in which they stand, are: (1) The root of the male shield-fern (*Aspidium filix mas*), of which the best preparation is the 'Liquid-Extract of Fern-root.' It may be taken in the morning before breakfast, in doses of about a scruple, in the form of an emulsion with yelk of egg, syrup of orange-peel, and water; and if the worm does not come away in six hours, a brisk purgative should be administered. Generally, however, the worm is expelled by a single dose, in the mass, and without pain or much uneasiness. (2) *Cusso* or *Kousso*, the flowers of *Brayera anthelmintica*, in doses of half an ounce to an ounce of the flowers (infused for a quarter of an hour in ten ounces of lukewarm water, and a little lemon-juice), or of four ounces of the infusion of the pharmacopœia, and followed in four hours, if it has not acted, by a dose of castor-oil—a safe and sure remedy. (3) Decoction of the bark of the root of the Pomegranate tree (*Granati radix*). (4) *Oil of Turpentine* (q.v.). Besides these, the seeds of the Common Pumpkin (*Cucurbita pepo*); *Kamela*, the powder adhering to the capsules of *Rottlera tinctoria;* Santonin, etc., have found their advocates. All anthelmintics should be taken fasting, or after a light supper on the previous evening.

Foremost among remedies for *Ascaris lumbricoides*, or large round worm, Cobbold places *Santonin* (q. v.); but kamala also is very efficacious in doses of one to two drams every four hours. Waring, in *Materia Medica*, gives a long list of remedies employed with success in the East, but unknown in western lands. *Ascaris vermicularis*, or the *threadworm*, is more successfully attacked locally in the rectum by injection, than by medicines administered in the ordinary method. Among the best forms of enemata are half a dram of tincture of sesquichloride of iron in a little gruel, retained in the bowel as long as possible; or injections of salt and water, or of infusion of quassia. As an internal remedy, santonin is the best. The most annoying symptom occasioned by these worms, the intense itching about the lower part of the bowel, especially in

the evening and at night, is best relieved by introduction of a little mercurial ointment within the verge of the anus, when the patient retires to rest.

VERMIGLI, *vĕr-mēl'yē*, PIETRO MARTIRE, *pē-ā'tro mär'tē-rā* (Peter Martyr): theologian: 1500, Sep. 8—1562, Nov. 12; b. Florence, Italy. As member of the order of Augustinian canons regular, he was famous throughout Italy for learning and eloquence. Conversation with a convert to Protestantism, and the subsequent reading of works by Bucer, Zwingli, and Melanchthon, led V. to adopt the doctrine of the Reformers. He still remained in the Augustinian order, and was prior of a convent in Lucca, when, his sympathy with the leaders of the Reformation becoming known, he had to flee from Italy and take refuge in Switzerland 1542. He became afterward prof. of theol. in Strasburg. Invited to England by Abp. Cranmer 1547 he became lecturer on the Scriptures at Oxford Univ. When Mary became queen, V. returned to Strasburg, where he lectured on Aristotle's philosophy till 1556, then becoming prof. of theol. in Zurich. His latest work, *The Commonplaces of the most famous and renowned Divine Doctor Peter Martyr*, as it is entitled by its editor, Anthony Marten, was dedicated to Queen Elizabeth.

VERMILION, n. *vĕr-mĭl'yŭn* [F. *vermillon*, vermilion; *vermeil*, ruddy—from mid. L. *vermic'ŭlus*, scarlet color—from the worm, L. *vermis*, of the gall-nut, from which a red color was obtained]: a brilliant red pigment originally prepared by grinding native cinnabar to a powder, but now made artificially by subliming the red sulphide of mercury or cinnabar; any similar brilliant red: V. to cover with vermilion or any delicate red color. VERMIL'-IONED, pp. a. *-yŭnd*, dyed with a bright red. VERMIL, n. a. *vĕr'mĭl*, in *OE.*, vermilion; of the color of vermilion.—*Vermilion*, or artificial Cinnabar (q.v.), is a bisulphide of mercury, formed by mixing 100 parts of the metal with 16 parts of sulphur, and subliming them in properly constructed retorts; the result is, a heavy dull-red cake, about an inch in thickness, of an acicular crystalline texture, and exactly resembling in these respects the native cinnabar. When, however, it is finely powdered, it acquires the beautiful bright red color well known in this pigment. The finest European V. was formerly made at Utrecht in Holland; it is now manufactured in other places, particularly in Istria. A new process, invented by Kirchoff, has also been introduced, and is employed in most manufactories for making the finest quality. It is called the humid or wet process, from the employment of water, with which the ingredients are triturated at a temperature of not more than 130° F., until the mixture, at first black, turns brownish red, when the temperature is lowered to 114° F., and steadily maintained at that until the brightest color is obtained; it is then allowed to subside, the liquid is decanted off, and the residue washed in clean water. The Chinese have always been famous for the beauty of their vermilion.

VERMIN, n. *vĕr'mĭn* [F. *vermine*, vermin—from L. *vermis*, a worm]: any kind of disgusting or hurtful creatures of small size; term applied to persons in contempt. VER'MINATE, v. *-nāt*, to breed vermin. VER'MINA'TION, n. *-nā'shun*, a breeding of vermin; a griping of the bowels. VER'MINOUS, a *-ŭs*, breeding vermin; springing from the presence of vermin. VER'MINOUSLY, ad. *-lĭ*.—*Vermin* is a term applied to noxious and disgusting insects, e.g., lice, fleas, bed-bugs, etc., as well as to such small mammals as multiply rapidly and are injurious to crops, etc., or infest dwellings, etc.: among the more common and destructive of the last class are rats, mice, weasels, polecats, squirrels, rabbits, moles, etc. Among V., in some places, are reckoned such birds as are injurious to crops. Small birds, such as feed both on insects and seeds, are not to be regarded as V. They consume, it is true, a certain portion of the grain; but they are of incalculable use in devouring those insects which are the worst of all destroyers of crops. The consequences which have ensued from the great reduction of the numbers of small birds in France, where they are eagerly sought for the table, are a warning to the farmers of all other countries. The most intelligent agriculturists of France are now solicitous for the increase of the numbers of small birds, as their only protection against caterpillars and grubs of many kinds.

Moles are among the animals commonly regarded as V. by farmers and gardeners; and in gardens they are certainly a pest; but they are insectivorous, and so beneficial. It is probable that many pastures owe much of their long-continued fertility to the incessant stirring of the soil by moles; and when they are not excessively numerous, it may be better to undertake the labor of scattering the mole-hills than to attempt the destruction of the creatures which throw them up.

Even rats and mice, often among the most troublesome of V. are not always mere pests. Much of the refuse of towns would probably become far more offensive and injurious if left to putrefy; and the rats, which frequent the most filthy places, render valuable service by devouring it.

Among means for destruction of V. are traps and poison. The common spring-trap for rats is liable to the objection that cats or dogs may be caught in it. Rats also learn to suspect danger, and avoid the trap, guided probably by their sense of smell, which is very acute and apprises them of the touch of human hands. To overcome this difficulty, oil of aniseed, or oil of caraway, is often used; which seems to render the bait more attractive, while it overpowers the warning smell. Professional rat catchers ascribe especial value to oil of rhodium, but it is more expensive than the oils above named. Rubbing the hands with a mixture of essential oils before setting the trap will prevent the scent of the hands from being noticed by rats. Mixture of oils recommended for rats: oil of rhodium 1 scruple, oil of caraway 1 dram, oil of lavender 5 drops, oil of aniseed 10 drops, tincture of musk 2 drops. A good

poison for rats, and scarcely dangerous to other animals, is the following: hog's-lard is melted in a bottle plunged in water at a temperature of 150° F., and an ounce of phosphorus is added to every lb. of lard, with a quantity of proof-spirit, to aid the mixture of the lard and phosphorus, which, when cooled, form a white mass, the spirit separating from it, so as to be fit for use again. This compound, very gently warmed, and mixed with flour and sugar, may be made into pellets, flavored with some of the attractive oils, and laid down near rat-holes, or where field-mice are very abundant. For a method of destroying the field-vole, or short-tailed field-mouse, by digging pits, see VOLE. One method of destroying rats is that of spreading the floor with caustic potash, which, adhering to the rats' feet, is licked off: the result is obvious.

VERMIPAROUS, a. *vĕr-mĭp'ă-rŭs* [L. *vermis*, a worm. *parĭō*, I produce]: producing or bringing forth worms, VERMIV'OROUS, a. *-mĭv'ō-rŭs* [L. *voro*, I devour]: feeding on worms.

VERMONT, *vĕr-mŏnt′:* state; one of the United States of America; first in order of admission into the Union under the federal constitution; popularly known as the 'Green Mountain State.'

Location and Area.—V. is in lat. 42° 44′—45° n., long. 71° 30′—73° 26′ w.; bounded n. by Quebec, Canada; e. by N. H.; s. by Mass.; w. by N. Y.; extreme length n. to s. 157½ m., breadth 35–85 m.; Lake Champlain waterfront 105 m.; land area 9,135 sq. m., water 430 sq. m., gross 9,565 sq. m. (6,121,600 acres); highest elevation Mount Mansfield, 4,430 ft.; principal harbor Burlington; cap. Montpelier.

Topography.—The Connecticut river forms the entire e. boundary of the state, and Lake Champlain (q.v.) two-thirds of the w. boundary. The Green Mountains, which extend entirely through the state nearly n.e. to s.w., enter it by two distinct chains from Canada, the w. directly, the e. by way of n. N. H., and unite at the 44th parallel, extending thence into Mass., near the Hoosac Tunnel. The mountains thus provide a continuous and nearly central line of watershed, the region on the e. being drained by the Connecticut river and its affluents; that on the w. by the feeders of Lake Champlain, such as the Missisquoi, Lamoille, Winooski, and Poultney rivers and Otter and Hubbardton creeks; while the extreme n. region has additional drainage from streams entering Lake Memphremagog. The highest points of the Green Mountains, all less than the highest of the White Mountains in N. H., are, according to Prof. Guyot, the 'chin' and 'nose' of Mount Mansfield, 4,430 and 4,094 ft. respectively; the 'forehead,' or S. Peak, 3,934; Killington Peak 4,221; Killington Dome 3,954; Camel's Hump 4,088; Equinox Mountain 3,872; Shrewsbury Peak 3,845; Green Peak 3,148; Mt. Lincoln 4,078; Mt. Sterling 3,700; Hogback Mountain 3,648; Jay Peak 4,018; Bald Mountain 3,124; and the detached Mt. Ascutney 3,320. Beside the rivers, creeks, and lakes mentioned, there are nearly 100 bodies of water, some of considerable size, including Willoughby, Seymour, Maidstone, Dummer, Bombazine, Austin, and Great Trout Pond; also the medicinal mineral springs of Alburg, Brunswick, Clarendon, Hartford, Highgate, Newbury, Panton, and Williamstown.

Climate.—The climate is exceedingly healthful, though subject to great extremes, the winters being long and cold, and the summers short, with brief spells of considerable heat. The mean annual temperature ranges from 40° in the n.e. to about 46° in the s. and s.w.; winter range at Burlington 18°—33°, sometimes falling to —10° or even —20°; summer 66°—71°, sometimes rising to 90°; average annual rainfall 48·60 inches.

Geology.—The surface rocks of the Green Mountains are not granitic, the entire range showing gneiss and schists with quartz rock in belts and crystalline limestone in beds. Drift appears in nearly all parts of the state, alluvial deposits appear along most of the streams,

and Lower Silurian and Primordial rocks in the Champlain valley, with sea shells in the clay of the lake's banks. The economic properties are statuary, variegated, and veined marble; argillaceous slate; granite, syenite, and sandstone for building; soapstone; porcelain clay; freestone; whetstones; copper; manganese ore; chromic iron; lead; and some gold.—V. is particularly rich in timber, her forest growths including the sugar maple, hemlock, fir, spruce, pine, oak, hickory, beech, birch, elm, rock and red maple, butternut, basswood, tulip, cedar, and juniper. The soil generally is very fertile, and there are large tracts of nutritious grass-land, which support great herds of horses, cattle, and sheep.

Zoology.—Large game, like the moose, elk, black bear, panther, and deer, are becoming very scarce; small game are abundant; numerous aquatic birds frequent the large lakes; the birds of prey and song are those common to New England; and the fish, particularly in Lake Champlain, include the muskelunge, lake trout, whitefish, pickerel, roach, and perch.

Agriculture.—In 1880 the farm-lands covered 4,882,588 acres (of which 3,286,461 were improved); comprised 35,522 farms, valued, with fences and buildings, at $199,-346,010; contained implements and machinery valued at $4,879,285; had live-stock valued at $16,586,195; cost for repairs and new buildings $607,962, and fertilizers $127,670; and yielded products valued at $22,082,656. The principal products were: barley 267,625 bushels; buckwheat 356,618; Indian corn 2,014,271; oats 3,742,-282; rye 71,733; wheat 337,257; hay 1,051,183 tons; hops 109,350 lbs.; tobacco 131,432; Irish potatoes 4,438,-172 bushels; wool 2,551,113 lbs.; milk 6,526,550 gals.; butter 25,240,826 lbs.; cheese 1,545,789. The live-stock comprised 75,215 horses; 283 mules and asses; 18,868 working oxen; 217,033 milch cows; 167,204 other cattle; 439,870 sheep; and 76,384 swine. The value of orchard products was $640,942. The principal cereal productions 1891, reported 1892, were: corn 2,144,000 bu., 57,638 acres, $1,629,542; oats 4,037,000 bu., 107,657 acres, $1,655,227; and wheat 344,000 bu., 19,637 acres, $392,477. The farm animals 1892 comprised 90,258 horses, value $6,894,201; 239,335 milch cows, value $5,823,021; 165,688 oxen and other cattle, $2,697,798; 358,274 sheep, $1,179,725; and 74,795 swine, $587,412—total head 931,350, value $18,172,-157.—The official estimate 1892 was: corn 1,643,000 bu.; oats 3,784,000 bu.; and wheat 151,000 bu.—The state agricultural experiment station at Burlington, is prepared to analyze and test fertilizers, cattle foods, seeds, soils, milk, and other agricultural materials and products; to identify grasses, weeds, and useful and injurious insects; and to give information on subjects pertaining to agricultural. The most important work was the promotion of the maple sugar industry, and 16,000 copies of the *Bulletin* on *Maple Sugar* were called for and distributed. The director believed that the work of the station in this line alone during the spring

1892 was worth more to the state than the entire cost of running the station the previous year. The number of farms (1900) was 33,104; acres improved 2,126,624; unimproved 2,597,816; aver. number acres to farm 142.7. The principal farm crops 1902 were corn 1,258,252 bush.; spring wheat 32,430 bush.; oats 3,111,200 bush.; barley 384,734 bush.; rye 32,837 bush.; buckwheat 258,900 bush.; potatoes 2,550,502 bush.; hay 1,177,135 tons; tobacco 343,800 lbs. The farm animals comprised 86,517 horses; 282,546 milch cows; 225,893 other cattle; 273,-876 sheep; 88,624 swine. In 1889-90 there were more than 1,000 farms in the state, formerly under cultivation, but then abandoned and one-half contained buildings in fair condition. The commissioner of agricultural inaugurated a scheme to re-people these farm lands, and met his first success 1890, when several families of Swedish farmers were located in Windham, Windsor, and Orange counties.

Manufactures.—V. had (1880) 2,874 manufacturing establishments, employing 27,540 hands, using a capital of $23,265,224, paying in wages $5,164,479, using materials valued at $18,330,677, and yielding products valued at $31,354,366. The chief industry according to capital employed was the manufacture of sawed lumber, which had 688 establishments, employed $3,274,250 capital, paid $426,953 wages and $2,021,868 materials, and received $3,258,816 for products. Next was scales and balances, which had 3 establishments, $3,051,481 capital, $410,786 wages, $215,215 materials, and $2,080,474 products. Then followed woolen goods, 44 establishments, $2,320,161 capital, $544,138 wages, $2,012,496 materials, and $3,217,807 products; flour and grist-mill products, 227 establishments, $1,152,461 capital, $81,589 wages, $2,602,641 materials, and $3,038,688 products; foundry and machine-shop products, 45 establishments, $1,137,-675 capital, $243,426 wages, $326,770 materials, and $783,-828 products; cotton goods, 8 establishments, $956,096 capital, $173,748 wages, $555,297 materials, and $915,864 products; marble and stone-work, 69 establishments, $904,575 capital, $394,400 wages, $535,837 materials, and $1,303,790 products; planed lumber, 18 establishments, $854,800 capital, $170,948 wages, $2,371,512 materials, and $2,709,522 products; musical instruments and materials, 2 establishments, $803,000 capital, $206,200 wages, $304,500 materials, and $680,800 products; paper, 13 establishments, $785,500 capital, $189,889 wages, $556,667 materials, and $1,237,484 products; mixed textiles, 7 establishments, $776,000 capital, $190,775 wages, $845,910 materials, and $1,277,903 products; and agricultural implements, 35 establishments, $640,900 capital, $165,894 wages, $357,639 materials, and $718,455 products.—In 1888 the legislature provided for the appointment of a commissioner to investigate the agricultural and manufacturing interests of the state, and to devise means to develop them. The commissioner's report for

1889-90 showed more than 3,500 manufacturing establishments, about 20,000 hands, more than $30,000,000 capital, and value of products $37,000,000. The number of establishments (1900) was 4,071; wage earners 29,455; capital invested $48,547,964; wages (not including salaries) $12,237,684; value materials $29,882,744; of products $57,646,715. The cheese, butter and condensed milk factories numbered 255; flour and grist mills 211; planing mills 46; lumber and timber works 658; marble and stone works 54; monument and tombstone works 268; foundries, etc., 61.

Quarries.—In value of product, marble ranked first 1889, the yield at Brandon being $200,000, and in Rutland co. $2,000,000. In the last-named region the production was increasing rapidly and substantially, with prospects of greatly increased annual outputs. In granite, V. ranked 9th among the states, and produced (1880) $59,675 (1890) $581,870. The varieties were biotite in Washington and Essex cos.; muscovite in Windsor co.; biotite-muscovite in Caledonia co.; and gabbro in various localities. There were in all 59 quarries, which produced 1,073,936 cubic ft. The capital invested in land for quarry purposes was $683,164, total capital $967,750; expenses were $477,114. Among the products were 236,759 cubic ft., valued at $45,198, and used for building purposes; 231,128 ft., value $48,323, used for street-work, paving, etc.; 373,020 ft., value $412,287, used for cemetery, monumental, and ornamental work; 197,834 ft., value $41,713, used for bridge, dam, and railroad work; and 35,195 ft., value $34,349, used for miscellaneous purposes. The slate formation occupies a part of the old Champlain valley, between the w. base of the Green Mountains in V., and the s. trend of the Adirondacks in N. Y., and in Rutland co., V., and Washington co., N. Y. In the part of this tract in V. there were 60 quarries, operated on a capital of $1,290,951, of which $730,900 were invested in land. The product was 235,850 squares of roofing slate, value $592,997, and slate for all other purposes, value $245,016, total value of products $838,013. The capital invested in marble quarries and mills (1901) exceeded $19,000,000. The production of marble in that year was valued at $2,753,583; of granite $1,245,828; slate $1,162,191; limestone $205,138.

Commerce.—During the year ending 1891, June 30, the foreign trade of V. comprised imports of merchandise $5,243,681, and exports of merchandise $3,067,545, and of coin and bullion $9,947. Of the total imports, $3,527,425 were dutiable; $1,716,256 non-dutiable; $5,238,983 imported direct from foreign countries; $4,743,659 were entered for immediate consumption, and $500,022 for warehouse; and $5,238,983 were brought in cars and other land vehicles and $4,698 in foreign steam vessels. The exports comprised lumber, brass and brass goods, brooms and brushes, cotton goods, perfumery and cosmetics, fish, glassware, hides and skins, rubber goods, including boots and shoes, builders' hardware, scales, sewing-machines, iron and steel goods, leather and

leather goods, musical instruments, sugar, paper, and leaf tobacco. The entrances were 28 American vessels of 3,367 tons, and 408 foreign vessels of 55,985 tons—total vessels 436, tonnage 59,352; and the clearances 10 American vessels of 1,580 tons, and 395 foreign vessels of 54,410 tons. For the year ending 1902, June 30, the value of merchandise exported (all domestic) was $7,770,146; imported $738,931, $390,274 was dutiable.

Railroads.—The first railroad, the Champlain and Connecticut River, was opened for travel 1849, Dec., and the second, the Vermont Central, 1850, Jan. The total mileage was 290. The development since has been (1860) 554; (1870) 614; (1876) 765; (1886) 946; (1890) 1,012; (1901, June 30) 1,060.17.

Religion.—The Congl. Churches are the most numerous in the state, reporting (1891) 198 churches, 168 ministers, 14,245 families, 20,676 members, 21,886 Sunday-school members, benevolent contributions $47,229, legacies $71,824, and contributions of 192 churches for home expenditures $195,822.

The Meth. Episc. Church reported (1892) conference of V., districts of Montpelier, St. Albans, St. Johnsbury, and Springfield, and district of Burlington in Troy (N. Y.) conference, in all 194 churches, 75 local preachers, 18,366 members, 227 Sunday schools, 2,710 officers and teachers, 19,024 scholars, 148 parsonages, value church property $792,650, parsonages $199,535, and contributions for ministerial support $109,698.

The Bapt. Churches reported (1890) 7 assocs., 109 churches, 93 ministers, 8,770 members, 86 Sunday schools, 1,070 officers and teachers, 8,500 scholars, value of church property $621,620, and aggregate contributions $81,567.

The Rom. Cath. Church reported (1892) the diocese of Burlington (established 1853 and comprising the whole state), 1 bp., 52 priests, 76 churches, 15 convents, 1 acad. for young men, 1 college, 6 academies for young ladies, 18 parochial schools with 4,000 pupils, 1 orphanage, and estimated Rom. Cath. pop. 46,000.

The Prot. Episc. Church reported (1892) the diocese of V. (organized 1790 and comprising the whole state), 1 bp., 32 clergy, 57 parishes and missions, 2,335 families, 4,461 communicants, 243 Sunday-school teachers, 2,024 scholars, 2 educational institutions, and $57,113 contributions.

The Free-Will Bapt. Churches reported (1892) 6 quarterly meetings, 49 churches, 48 ordained ministers and 5 licensed preachers, 2,445 members, and value of church property $67,900.

The Univ. Churches reported (1892) 67 parishes, 55 churches, 2,547 families, 34 church organizations, 1,611 members, 48 Sunday schools, 3,120 scholars, and church property valued at $304,500.

At the tenth international Sunday-school convention, at Denver, Col., 1902, June 26-30, there were re-

ported in V. a total of 781 Sunday schools; 7,870 officers and teachers; 54,230 scholars; total members 62,100.

Education.—In the school-year 1900-1 there were in the state more than 2,280 public-school dists.; 1,821 schools; 510 male and 3,232 female (3,742) teachers; 65,964 enrolled pupils; 47,020 pupils in average daily attendance; salaries $658,600; total expenditures $1,074,222. It was estimated that more than 6,000 children were attending private schools. Normal schools were maintained (1900-1) at Castleton, Johnson, and Randolph (3), and had 21 instructors, 383 pupils, 98 graduates in previous year and $16,400 in total receipts.

Schools for secondary instruction 1890 included for *boys:* Vermont Episcopal Institute, Burlington, with 7 instructors, 59 pupils, and $40,000 in grounds and buildings; for *girls:* St. Agnes Hall, Bellows Falls (Prot. Episc.), 4 instructors, 30 pupils, and the Bishop Hopkins Hall, Burlington (Prot. Episc.), 8 instructors, 33 pupils, 5,000 vols. in library, $250,000 in grounds and buildings, and $32,000 in productive funds; and for *both sexes:* Brigham Acad., Bakersfield (non-sect.), 5 instructors, 117 pupils, $12,784 in grounds and buildings, $30,000 in productive funds; Goddard Seminary, Barre (Univ.), 10 instructors, 149 pupils, $75,000 in grounds and buildings, $23,000 in productive funds; Chelsea Acad., Chelsea (non-sect.), 2 instructors, 67 pupils; Derby Acad., Derby, 3 instructors, 120 pupils, $8,000 in grounds and buildings; Essex Classical Institute, Essex (non-sect.), 2 instructors, 60 pupils, $10,000 in productive funds; New Hampton Institution, Fairfax (Bapt.), 3 instructors, 48 pupils, 3,000 vols. in library, $4,000 in grounds and buildings; Lamoille Central Acad., Hyde Park (non-sect.), 3 instructors, 155 pupils; Lyndon Institute, Lyndon Centre, 10 instructors, 211 pupils, $20,000 in grounds and buildings, $30,000 in productive funds; Burr and Burton Seminary, Manchester (non-sect.), 7 instructors, 89 pupils, $25,000 in grounds and buildings, $30,000 in productive funds; Vermont Meth. Seminary, Montpelier (Meth. Episc.), 9 instructors, 333 pupils, $80,000 in grounds and buildings, $40,000 in productive funds; Troy Conference Acad., Poultney (Meth. Episc.), 13 instructors, 228 pupils, $55,000 in grounds and buildings; St. Johnsbury Acad., St. Johnsbury (non-sect.), 11 instructors, 343 pupils, $15,000 in grounds and buildings, $100,000 in productive funds; Vermont Acad., Saxton's River (Bapt.), 10 instructors, 193 pupils, $100,000 in grounds and buildings, $100,000 in productive funds; Thetford Acad., Thetford (Congl.), 5 instructors, 90 pupils, $10,000 in grounds and buildings; Green Mountain Seminary, Waterbury Centre (Free Bapt.), 8 instructors, 104 pupils, $30,000 in grounds and buildings; and Glenwood Classical Seminary, West Brattleboro (Congl.), 5 instructors, 210 pupils, $8,000 in grounds and buildings, $10,000 in productive funds.

The Univ. of V., at Burlington, with which is connected the State Agricultural College, was chartered

1791, and had (1900-1) 63 professors and instructors and 494 students; see VERMONT, UNIVERSITY OF. There was one other college of liberal arts: Middlebury College, Middlebury, chartered 1800, which had (1901) 11 profs. and instructors, 113 students, some being women, 3 endowed professorships; 30 state scholarships, 90 other scholarships; 26,000 vols. in library; $22,000 in scientific apparatus; $200,000 in grounds and buildings; $380,000 in productive funds; $25,000 total income: Ezra Brainard, pres. Norwich Univ., at Northfield, a milit. college, chartered 1834, and under the auspices of the Prot. Episc. Church, has been widely and excellently known for many years: (1900-1) 9 instruc., 78 pupils, 4,000 vols. in lib., $36,000 in grounds and buildings, and income of $11,710, Charles H. Lewis, LL.D., pres. Medical instruction was provided by the medical dept. of the Univ. of V., opened 1823, and by the V. Medical College, at Rutland, opened 1887; and a training school for nurses was maintained in the Mary Fletcher Hospital, Burlington. There were 2 commercial colleges, at Burlington, and Rutland, which together had 8 instructors and 279 students; a state reform school, at Vergennes, and an Agricultural College connected with the Univ. of Vermont, with about 180 students.

The report of the state supt. of education for the two years ending 1892, Mar. 1, showed number of districts in the state 2,230; public schools 2,524; pupils in public schools 60,000; in private schools, exclusive of parochial, 3,552; in parochial schools 4,305; total 67,857. There were 538 male and 3,813 female teachers, of whom 684 had attended a state normal school and 482 had graduated thererfom. The net indebtedness of the school dists. was $162,569; number of school-houses 1,143; amount raised by town taxes $197,578, by dist taxes $363,126, receipts from rent of lands, $15,554; total revenues $727,782. The expenditures included teachers' salaries and board $549,980, new buildings $53,439, incidentals $37,763, whole expenditure $743,543. There were graded public schools in 46 cities and towns, averaging 13 grades each; 49 male and 340 female teachers; 21,843 children (5 to 20 years old); and 16,974 pupils. The 46 high schools had 2,425 pupils; 9,307 volumes in their libraries; 247 graduates (1892); and 69 pupils preparing for college.—In 92 cities and towns there were 54 public libraries, which had 59,400 volumes; 24 free libraries, with 87,681 volumes; and 30 dist. libraries, with 6,337 volumes; total volumes 153,418.—During 1900-1 teachers' institutes, lasting from one to four days each, were held in 40 cities and towns.

Illiteracy.—Persons 10 years old and upward enumerated (1880) 264,052, unable to read 12,993, unable to write 15,837, whites unable to write 15,681; foreign-born whites enumerated 38,884, unable to write 10,327; whites 10–14 years old enumerated 33,449, unable to write 1,210: males 728, females 482; whites 15–20 years old enumerated 38,203, unable to write 1,599: males 943, females 656; whites 21 years old and upward enumerated 191,593,

unable to write 12,872; males 6,731, females 6,141; colored persons 10 years old and upward enumerated 807, unable to write 156; colored 10-20 years old enunumerated 266, unable to write 27; 21 years and upward, enumerated 541, unable to write 129. In 1900 the total illiterate pop. of 10 years old and upward numbered 16,-247, 9,507 of whom were males: native white, 6,934; foreign born 9,205, colored 99.

Finances and Banking.—The receipts in state treas. in biennial term ending 1892, June 30, aggregated $2,256,-294; resources and liabilities $537,995. The total debt of the state 1902, July 1, was $422,381.49; assessed valuation of real estate $120,831,099; personal $59,828,265; tax rate $2.05 per $1,000; total resources (1900) $541,-573.99; liabilities $208,658.06.—1892, Mar. 1, there were 50 nat. bks., with $7,210,000 cap.; $2,705,790 surplus and profits, and $8,009,476 in individual deposits.—1892, June 30, there were 21 sav. bks. and 15 trust cos., with 80,740 depositors; $14,050,167 loans on real estate, and $2,656,349 on personal security; $1,082,114 cash in banks; $741,087 paid in dividends; and $24,674,741 in total deposits.—There were 2 state investment and guarantee cos., with $1,729,024 in assets and liabilities. In 1902, June 30, there were 47 national banks with cap. of $6,643,333, surplus $1,513,642; 2 state banks, cap. $25,-000, surp. $30,955; 2 priv. banks, cap. $15,000, surp. $5,-000; 19 loan and trust cos., cap. $928,000, surp. $337,443.

History.—V. was discovered by Samuel de Champlain (q.v.) 1609, and was settled first by people from Mass., who built Fort Dummer, on the site of Brattleborough, 1724. In 1731 a party of French Canadians began a settlement on the e. shore of Lake Champlain. Fort Dummer was the base of milit. operations against the French in the war of 1745, and after the second war, 1755–58, soldiers and others, who had become acquainted with the region during the wars, began to seek homes w. of the Connecticut river. As N. H. claimed jurisdiction over the territory, her gov., Benning Wentworth, issued grants of land to settlers in 138 townships, whence the region became known as the 'New Hampshire grants.' But the colony of N. Y. also claimed jurisdiction, under grants from Charles II. to the duke of York. Both govs. issued proclamations asserting their claims, and the gov. of N. Y. made several attempts to dispossess the settlers, but without success. On an appeal to the king the controversy was decided in favor of N. Y.; but the 'Green Mountain boys' maintained a successful resistance to all attempts to eject them; and amid counter-proclamations and threats by the two govs., the struggle was kept up till the revolutionary war, when it was suspended for the greater struggle. Through the war, led by Ethan Allen, Seth Warner, Remember Baker, and other patriots, the people of V. performed feats of conspicuous gallantry and great public importance; they captured Fort Ticon-

deroga, and took part in the battles of Lake Champlain and the two engagements at Bennington. Meanwhile they were active in seeking to secure larger political rights. In 1776 they sought admission into the confederacy of the 13 colonies, but withdrew their petition in consequence of the opposition of N. Y. The following year they held a convention, declared themselves independent both of N. Y. and N. H., adopted a constitution and chose the present state name, and renewed their application to the provincial congress for admission. It was not till 1781 that their petitions were seriously considered, and then the congress offered to admit them with a specified curtailment of territory. The proposition met general opposition and was refused. In 1790 N. Y. revived the old question of its jurisdictional rights, and offered to abandon all claims to land in or jurisdiction over V. on the payment of $30,000. This proposition was accepted, and V. was admitted to the Union 1791, Mar. 4. The constitution adopted 1777 was amended 1786, 93, and 1870. During the war 1812–15, though the gov. refused to call out the state troops and forbade them leaving the state, V. volunteers took part in the battle of Plattsburg, the naval action on Lake Champlain, and other engagements. In the civil war V. furnished 33,288 men to the Union armies, St. Albans was raided 1864, Oct. 19, by a Confederate party from Canada; and it was the headquarters of a body of Fenians 1870, who were prevented by the U. S. authorities from making a raid into Canada. The state maintains prohibition of the liquor traffic; and compulsory education.

Government.—The executive authority is vested by the constitution (amended 1870) in a gov. of limited powers, elected by the people for two years, salary $1,500 per annum; lieut.gov., elected similarly, salary as pres. of the senate $6 per day while the legislature is in session; treas., elected similarly, salary $1,500 per annum; sec. of state, auditor, and supt. of education, elected by the legislature, salary of each $1,500 per annum; and an inspector of finance, of savings banks, and of trust companies, adjt.gen., quartermaster-gen., inspector-gen., judge-adv.gen., surgeon-gen., commissioners of the insane, of railroads, of insurance, and of fisheries, state librarian, and state geologist.—The legislative authority is vested in a general assembly, comprising (1903) a senate of 30 mem. and a house of representatives of 242 members, each elected for two years, salary of each $3 per day during the session. The legislature meets in biennial session in Oct., in the even-numbered years, session not limited. Excluding persons convicted of bribery, every male 21 years old and upward, who is a citizen of the United States and has been a resident of the state for one year, may vote on subscribing to an oath or making affirmation that he will strive to promote the welfare of the state.—The judicial authority is vested in a supreme court of one chief-

justice and 6 assoc. justices, elected by the legislature for two years, salary of each $2,500 per annum; co. courts of one supreme court judge and two co. judges; courts of probate; and the usual minor officers; co. and probate judges, sheriffs, state attorneys, and high bailiffs being elected for two years by the voters of the cos. Other officials are U. S. district court judge, salary $3,500, U. S. collector of internal revenues, salary $2,650, and U. S. collector of customs, salary $1,000 and fees. 1901, Jan. 1, there were in V. 572 post-offices, of which 8 were second-class, 36 third-class, 45 presidential, 527 fourth-class, 346 money-order offices, and 6 money order stations.

The successive govs., with their terms of service, are as follows: Moses Robinson 1789–90; Thomas Chittenden 1790–97; Isaac Tichenor 1797–1807; Israel Smith 1807–8; Isaac Tichenor 1808–9; Jonas Galusha 1809–13; Martin Chittenden 1813–15; Jonas Galusha 1815–20; Richard Skinner 1820–23; Cornelius P. Van Ness 1823–26, Ezra Butler 1826–28; Samuel C. Crafts 1828–31; William A. Palmer 1831–35; Silas A. Jenison 1835–41; Charles Paine 1841–43; John Mattocks 1843–4; William Slade 1844–46; Horace Eaton 1846–49; Carlos Coolidge 1849–50; Charles K. Williams 1850–52; Erastus Fairbanks 1852–3; John S. Robinson 1853–4; Stephen Royce 1854–56; Ryland Fletcher 1856–58; Hiland Hall 1858–60; Erastus Fairbanks 1860–1; Frederick Holbrook 1861–63; John G. Smith 1863–65; Paul Dillingham 1865–67; John B. Page 1867–69; Peter T. Washburn 1869–70; John W. Stewart 1870–72; Julius Converse 1872–74; Asahel Peck 1874–76; Horace Fairbanks 1876–78; Redfield Proctor 1878–80; Roswell Farnham 1880–82; John L. Barstow 1882–84; Samuel E. Pingree 1884–86; E. J. Ormsbee 1886–88; William P. Dillingham 1888–90; Carroll S. Page 1890–92; Levi K. Fuller 1892-94; Urban A. Woodbury 1894-96; Josiah Grout 1896-98; Edward C. Smith 1898-1900; W. W. Stickney 1900-2; J. G. McCullough 1902-4.

Counties, Cities and Towns.—V. was divided (1903) into 14 counties. In 1880 the most populous *counties* were: Rutland 41,829; Windsor 35,196; Chittenden 32,792; Franklin 30,225; Windham 26,763; Washington 25,404; Addison 24,173; Caledonia 23,607; Orange 23,525; and Orleans 22,083. The most populous *cities and towns* were: Rutland 12,149; Burlington 11,365; St. Albans 7,193; Bennington 6,333; Brattleboro 5,880; St. Johnsbury 5,800; Colchester 4,421: Rockingham 3,797: Montpelier 3,219; and Barre 2,060.—In 1900 the most populous *counties* were: Rutland 44.209; Chittenden 39,600; Washington 36,607; Windsor 32,225; Franklin 30,198; Windham 26,660; Caledonia 24.381; Orleans 22,024; Addison, 21,912; and Bennington, 21,705. The most populous *cities and towns:* Burlington 18,640; Rutland 11,499; St. Albans 6,239; Brattleboro 6,640; Barre 8,448; St. Johnsbury 7,010; Montpelier 6,266; Rockingham 5,809; Bennington 5,656.

Politics.—State elections are held biennially on first

Tuesday in Sep.; congressional and presidential on Tuesday after first Monday in Nov. The state govt. (1903) was republican in executive officers and legislature, with a party majority in the latter of 20 in the senate, 142 in the house, and 162 on joint ballot. V. had (1890) 4 electoral votes, which were unchanged by the reapportionment on the (1900) census. For the presidential vote, see PRESIDENT AND VICE-PRESIDENT, ELECTION OF.

Population.—(1790) white 85,154, colored 271, total 85,425; (1800) white 153,908, colored 557, total 154,465; (1810) white 217,145, colored 750, total 217,895; (1820) white 235,063, colored 903, total 235,966; (1830) white 279,771, colored 881, total 280,652; (1840) white 291,218, colored 730, total 291,948; (1850) white 313,402, colored 718, total 314,120; (1860) white 314,369, colored 709, total 315,098; (1870) white 329,613, colored 924, total 330,551; (1880) white 331,218, colored 1,068, total 332,286; (1890) white 331,418, colored 937, total 332,355; (1900) white 342,771, colored 870, total 343,641.

VERMONT', UNIVERSITY OF: institution of learning at Burlington, Vt., founded 1791. Since 1865, when the Vt. legislature transferred to the funds of the univ. the proceeds of the sale of lands granted to the state by congress for promotion of agricultural science and diffusion of knowledge of the mechanic arts, the univ. has borne the official designation 'University of Vermont and State Agricultural College.' It is a state institution, and not under control of any religious sect. The endowments are chiefly lands granted by the state and by individual benefactors: these lands are leased to their occupants by the trustees of the univ. The buildings occupy a commanding site overlooking Lake Champlain, with the Adirondack Mts. and the Green Mts. forming the horizon on all sides. Connected with the agricultural dept. is an agricultural experiment station, in which experiments and investigations are made for the benefit of the farmers of the state. In the academic year 1891-2 the number of students in the academic dept. was 157; agricultural dept. 166, of whom 21 took the full course, and 145 the farmer's course; medical dept. 203: total in all depts. 526. The number of profs. and instructors in all depts. was 43. The catalogue of the same year announced an improved course in mech. eng., also in elec. 1900-1 acad. dept. had 33 profs. and instructors, 291 students, of whom 57 were women; 61,000 vols. in library; val. grounds and buildings $600,000; productive funds $463,117; total income $75,444. The agric. and mech. dept. had 33 professors and instructors, 179 students; val. farm and grounds $9,500; of buildings $520,000; of library $150,000. The charter of the institution provides 'that there shall at all times be maintained . . . such instruction in the various branches of learning as is contemplated in the several charters of each of the institutions [univ. and agricultural college] hereby united; and more particularly including a 4 years' course of studies similar to such as are generally taught in other colleges.' Also it is provided that there shall be 'facilities and extended scope and variety in the study of those branches which relate to military tactics, agriculture, and the mechanic arts.'—The pres. is Matthew Henry Buckham, D.D.

VERNACULAR, a. *vêr-năk'ū-lêr* [L. *vernac'ŭlus*, vernacular, indigenous—from *verna*, a home-born slave]: native; peculiar to the person by birth or nature; belonging to the country of one's birth: N. the language or peculiar idiom of any place. VERNAC'ULARLY, ad. *-lĭ*. VERNAC'ULOUS, a. *-lŭs*, in *OE.*, vernacular.

VERNAL, a. *vêr'năl* [L. *vernālis*, of or pertaining to spring—from *ver*, the season of spring]: belonging to the spring; appearing in spring; belonging to youth. VER'NALLY, ad. *-lĭ*. VERNA'TION, n. *-nā'shŭn*, in *bot.*, prefoliation; the arrangement of the leaves in the leaf-bud; corresponding to ÆSTIVATION (q.v.) in the flower-bud. There are great differences in the vernation of plants, and these differences are characteristic not only of species but of genera, and even of natural orders; but the vernation of

the same species is always the same. In some the leaves are very simply placed together; in others they are most curiously folded, rolled, or plaited, and interlaced with each other, yet so as to separate readily when the proper time for their expansion comes. VER'NANT, a. *-nănt*, in *OE.*, flourishing, as in spring. VERNAL EQUINOX, with respect to the northern hemisphere, the period when the sun crosses from the s. to the n. of the equinoctial, about Mar. 21 (see EQUINOX). VERNAL-GRASS, a common meadow-grass; spring-grass; the *Anthoxanthum odorātum*, common in Great Britain and throughout Europe, and naturalized in the United States. It is about 12 in. high, with spiked oblong panicle, the flowers remarkable as having only two stamens. The spikelets are 1-flowered; glumes very unequal; the floret is accompanied with two rudimentary florets, which botanists have generally described as two outer paleæ. This grass flowers earlier in summer than most of the European grasses. It is called also Sweet V.-Grass and Sweet-scented V.-Grass: it contains Coumarin (q.v.), and yields by distillation an essential oil of agreeable odor. The straw of this grass is of use for the finest kinds of straw-plaiting.

VERNE, *vĕrn*, JULES: writer of comedies and pseudo-scientific romances: b. Nantes, France, 1828, Feb. 8. His first comedy, *Pailles Rompues*, was produced 1850; it was followed by *Onze Jours de Siège; L'Oncle d'Amérique;* and several comic operas. These had great success in Paris; but V.'s fame rests chiefly on his long series of mock-scientific extravaganzas, beginning with *Five Weeks in a Balloon*, 1863. Prior to 1892 the list of these romances comprised nearly 60 separate stories, of which more than 30 have been translated into English and published in large editions in England and the United States. The titles of a few are: *Journey to the Centre of the Earth;* 20,000 *Leagues under the Sea; From Earth to Moon; The English at the North Pole; Dr. Ox's Experiments; Michael Strogoff; Hector Servadac; Dick Sands; Mathias Sandorf; Purchase of the N. Pole.*

VERNET, *vĕr-nā'*, ANTOINE CHARLES HORACE (popularly known as CARLE V.): French painter of battle-pieces, hunting-pieces, etc.: 1758–1835, Nov. 17; b. Bordeaux; son of Claude Joseph V. (q.v.). He received his education first from his father, afterward at the Acad. of Paris, where 1782 he gained the chief prize, which brought the privilege of studying for some years in Rome. On his return his success in Paris was great; he achieved the highest honors of his profession, became chevalier of the order of St. Michel and of the Legion d'Honneur. He was renowned especially as a painter of horses; but his chief works were battle-pieces on a large scale, chiefly commemorative of the triumphs of Napoleon, and, as such, amazingly popular with the Parisian public. The principal are: *The Battle of Marengo, The Morning of Austerlitz, The Emperor giving Orders to his Marshals, The Bombardment of Madrid, Battle of Rivoli, Entrance of Napoleon into Milan*, and *Battle of Wagram.* He died in Paris.

VERNET', CLAUDE JOSEPH: French painter: 1714, Aug. 14—1789, Dec. 3; b. Avignon; son of Antoine V., also a painter. He went at the age of 18 to Italy, and remained there 20 years, much of the time in struggle and privation. At last (1752) his reputation as a landscape and marine painter had become so high that he was invited to Paris by Louis XV., who assigned him apartments in the Louvre. He painted an immense number of pictures. One of his chief undertakings was a series of 15 large pieces commissioned by govt., representing the chief seaports of France. These are in the Louvre, with many others of his best works. His pictures were reproduced by numerous engravers. 'Perhaps no other painter of landscapes or sea-pieces has ever made the human figure so completely a part of the scene depicted, or so important a factor in his design.' He married at Rome an English lady, a Miss Parker. He died in Paris.

VERNET', ÉMILE JEAN HORACE: French military painter: 1789, June 30—1863, Jan. 17; b. Paris; son of Antoine Charles Horace V. (q.v.). His youth was passed amid the tumults and anarchy of the Revolution; and his general education was irregular and incomplete; but he had a hereditary artistic gift, and was instructed by his father. He married, and began his career as a painter, at the age of 20. The *rôle* which he chose was that suggested at once by his father's success and by the military intoxication of the Parisian public. Young as he was, he had served as a soldier. Departing from the old conventional and imaginative treatment of military scenes, he presented the visible fact—thereby perhaps suffering loss in 'composition' and in deep suggestiveness; but gaining in fidelity and closeness of mere representation of the halt, the bivouac, or the battle. The success of this mode—a mode whose full meaning could be grasped by all observers—was brilliant and instantaneous; his first pictures of the kind—*The Dog of the Regiment and the Horse of the Trumpet, Capture of the Redoubt, Halt of French Soldiers,* etc.—being received with an enthusiasm of favor accorded to no other artist. In 1812 the first-class medal was awarded to him; and 1814 the emperor conferred on him the title chevalier of the Legion d'Honneur. The favor which he received from the emperor, whose victories he signalized on his canvas, was continued to him by the restored dynasty, whose sympathy with these favorite subjects (which, as occasion served, he continued to paint) could hardly be supposed to be unqualified. By Charles X. he was made officer of the Legion d'Honneur 1825; and he was elected member of the Institute 1826. In 1827 he was appointed director of the French Acad. at Rome, whither he went to reside for several years; and on the withdrawal of the French legation, occasioned by the revolution of 1830, he was appointed to act as representative of his country at the Roman court. One of V.'s most gigantic undertakings, the grand series of paintings decorating the Constantine Gallery at Versailles, commemorative of the triumphs of the French arms in Algeria,

was prescribed to him by Louis Philippe, and was executed in the brief space of three years. In pursuance of this object, he more than once visited Algeria. To the last, honors flowed upon him: in 1842 he was made commander of the Legion d'Honneur; in the Universal Exposition of 1855 the grand medal of honor was awarded to him. Besides military pieces, V. painted many others—e.g., *School of Raphael, Judith and Holofernes.* With amazing facility, like that which pertains to the most brilliant off-hand sketch, V. combines a surprising vigor, movement, and fiery effect.

VERNICOSE, a. *vĕr'nĭ-kōs* [mid. L. *vernix*, varnish (see VARNISH)]: in *bot.*, having a natural varnish.

VERNIER, n. *vĕr'nĭ-ĕr* [after the inventor, Pierre *Vernier* (b. in Burgundy about 1580, d. 1637), who gave a description of it in a pamphlet pub. Brussels 1631]: an index which slides along the graduated scale or limb of an instr., used for measuring minute fractional parts of the smallest spaces of the fixed scale. The principle of the Vernier is essentially as follows: AB (fig. 1) is a portion of the graduated scale of an instrument showing divi-

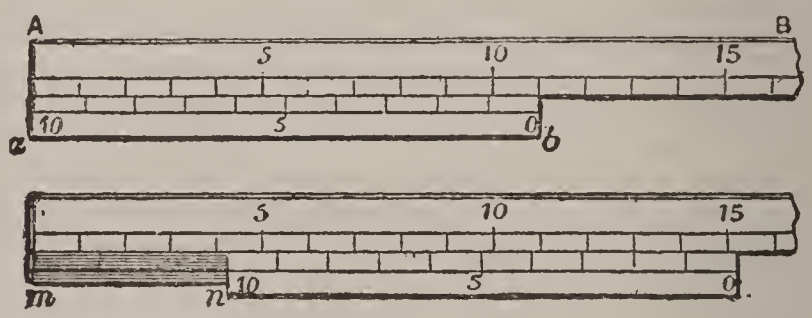


Fig. 1.

sions and subdivisions; *ab*, a small scale (the *vernier*), made to slide along the edge of the other and so divided that *ten* of its subdivisions are equal to *eleven* of the smallest divisions of the scale AB; then each division of the vernier is equivalent to $1\frac{1}{10}$ of a subdivision of AB; consequently, if the zero-point of the vernier be (fig. 1, A) opposite 11 on AB, the 1 on the vernier is at $9\frac{9}{10}$ ($1\frac{1}{10}$ below 11), 2 on vernier is at $8\frac{8}{10}$ ($2\frac{2}{10}$ below 11), etc. Also, if the vernier be slid along so that 1 on it coincides with a division on the scale, then 0 on the vernier is *one*-tenth above the next division on the scale; if 4 on the vernier coincide with a division on the scale, the 0 of the vernier is *four*-tenths above a division. The vernier is applied to instruments by being carried at the extremity of the index-limb, the zero on the vernier being taken as the index-point; and when the reading-off is to be performed, the position of the zero-point, with reference to the divisions of the scale, gives the result as correctly as the mechanical graduation by itself permits, and the number of the division of the vernier which coincides with a division of the scale, supplements this result by the addition of a fractional part of the smallest subdivision of the scale. Thus (fig. 1, B), suppose the scale-divisions to be degrees, then

the reading by the graduation alone gives only a result between 15° and 16°; but as the 2d division of the vernier coincides with a graduation on the scale, it follows that the zero-point is $\frac{2}{10}$ of a division above 15°, and that, therefore, the correct reading is 15°·2. It will be at once seen that by merely increasing the size of the vernier, e.g., making 20 divisions of it coincide with 21 on the scale, the latter may be read off to $\frac{1}{20}$ths; and a still greater increase in the size of the vernier would secure further accuracy.

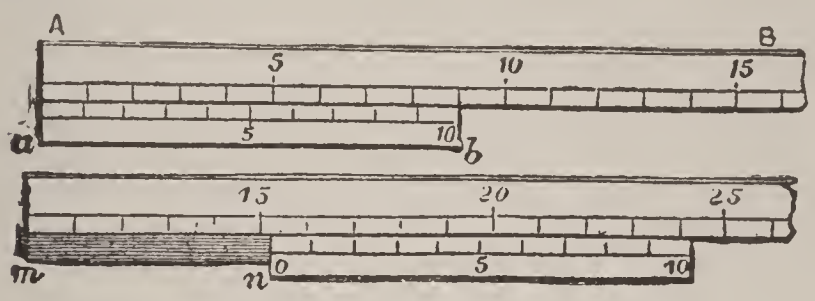


Fig. 2.

In the more recently constructed astronomical and geodesical instruments, a vernier is employed which has one graduation *more* (fig. 2) than the corresponding portion of the scale. A little consideration will show that the only effect of this modification is to enable the vernier to be graduated toward the same direction as the scale, and thus save a little confusion in the reading off. In small instruments, or where the utmost accuracy is required, a small magnifying lens is fixed over the vernier to enable the observer, in cases where no two graduations coincide (which is usually the case), to estimate the amount of error introduced by assuming that the two graduations which approach nearest to coincidence actually coincide.

Of the various methods for subdivision in use before the introduction of the vernier, the most important were the *Diagonal Scale* (q.v.) and the *Nonius*. The latter, so called from its inventor, Petrus Nonius (Pedro Nunez), Portuguese mathematician, who described it in a treatise *De Crepusculis Olyssipone* (1542), consists of 45 concentric circles described on the limb, and divided into quadrants by two diameters intersecting at right angles. The outermost of these quadrants was divided into 90, the next into 89, the third into 88, etc., and the last into 46 equal parts, giving on the whole a quadrantal division into 2,532 separate and unequal parts (amounting on an average to about 2′ intervals). The edge of the bar which carried the sights passed, when produced, through the centre; and served, consequently, as an index-limb; and whichever of the 45 circles it crossed at a graduation, on that circle was the angle read off; e.g., if it cut the 7th circle from the outside at its 43d graduation, the angle was read off as $\frac{43}{84}$ of 90°, or 46° 4′ $17\frac{1}{7}$″.

VERNON, *vĕr-nōng′:* town of France, dept. of Eure; on the left bank of the Seine, which is here spanned by a beautiful bridge of 22 arches; 50 m. w.n.w. of Paris by the Havre Rouen and Paris railway. It contains a handsome Gothic church, and numerous picturesque old houses with wooden frameworks; and has some trade in grain and wine; and carries on some cotton-weaving and stucco work.—Pop. (1881) 5,981; (1901) 7,000.

VERNON, *vĕr′non*, EDWARD: British naval officer: 1684, Nov. 12—1757, Oct. 29; b. Westminster, England. He was educated at Westminster School and Oxford; obtained a commission in the navy 1702, and that year was with the fleet under Admiral Hobson, which destroyed the allied French and Spanish fleets at Vigo. He was rear-admiral in active service 1708–27, and then he entered parliament. Having in a speech censuring the govt. declared that Puerto Bello might be taken with 6 ships, his assertion was at once put to the test by his assignment to the command of 6 men-of-war, with the rank of vice-admiral of the blue: he took Puerto Bello 1739, Nov. 22, after an assault lasting one day, his loss being only 7 men. He then bombarded and destroyed Fort Chagres on the Isthmus of Darien. In 1741, Jan., he sailed from Jamaica with a great fleet (29 ships of the line, 80 smaller vessels, 15,000 sailors, 12,000 soldiers), and after cruising in search of Spanish and French vessels, attacked Cartagena, the most strongly fortified port of Spanish America, but was repulsed with great loss: furthermore a pestilence visited his ships. He became admiral 1745; but 1746, Apr. 11, he was cashiered on account of a quarrel with the naval authorities. Smollett the novelist was in the Cartagena expedition, and describes the assault in *Roderick Random.* So was George Washington's bro., Lawrence, who named his estate in Va. Mt. Vernon, in honor of the admiral.

VERONA, *vā-rō′nâ:* ancient and interesting city of n. Italy, in Venetia; on a plain at the foot of the hills which lie at the base of the Tyrolese mountains, 72 m. w. of Venice by railway; on the Adige, by which it is divided into two unequal parts connected by four bridges. The aspect of the town, and the rich landscape around, is considered remarkably fine. V. is a fortress of the first rank, a member of the famous Quadrilateral (q.v.), and has always been considered a place of strength since it was surrounded with walls by Emperor Gallienus, 265. Its modern fortifications are among the most extraordinary works of military engineering in Europe: a circle of forts extends far outside the ancient walls. After passing into the hands of the Austrians 1815, it was greatly strengthened; and after 1849 they made every effort to render it impregnable.—Of its many interesting edifices, the chief is the amphitheatre, built, it is supposed, between A.D. 81 and 117. The building has been wonderfully preserved, the interior being still apparently in full preservation. The lesser diameter of the building is 404 ft., that of the arena 146 ft.; and the edifice is calculated to have

accommodated 22,000 people. This, as well as many other structures of the city, has a handsome appearance, having been built of Verona marble. The Porta dei Borsari and the Arco dei Leoni are fine Roman gateways, both of the imperial age. The streets of V. are wide, especially the Corso; there are four principal squares, of which the Piazza dei Signori contains the palace of the Della Scala and the superb Palazzo del Consiglio, whose façade is adorned with bronze and marble statues of celebrated natives of V., including Catullus, Pliny the Younger, etc. The picture gallery contains about 400 specimens, including a Transfiguration by Titian, and a full-length portrait and a Deposition by Paul Veronese. The cathedral, of uncertain date, but attributed to Charlemagne, has a handsome porch guarded by the celebrated paladins, Roland and Oliver. The more modern parts of the cathedral are exceedingly rich; among other excellent works of art, it contains a famous Assumption by Titian. There are about 40 churches, many of them beautiful specimens of Gothic architecture, and containing valuable paintings and other art treasures. The palaces also are numerous and fine; and there are several theatres, hospitals, etc. Manufactures of woolen goods, hats, cotton, silk, hemp, and hosiery are carried on; and the town trades with Venice in garlic sausages. Excellent cattle are reared on the rich pasturage of the vicinity. Wines and fruit are good and abundant.

The early history of V. is involved in obscurity, and there is difficulty in determining whether it belonged originally to the Euganei or the Cenomani. It afterward fell into the hands of the Romans, and under the Empire became one of the most flourishing cities in n. Italy. Constantine took it by assault 312; Stilicho defeated the Goths here 402. Charlemagne took possession of it, and made it the royal residence of his son, King Pepin. The Montagues, who were Ghibellines, lived here in perpetual and deadly enmity with the Guelf Capulets; and from the contentions between these families, Shakespeare—drawing on an Italian authority—derived materials for his tragedy of *Romeo and Juliet.* In 1259 the town received Mastino della Scala as its ruler. In 1405 the city gave itself over to Venice, to free itself from its tyrants, who were alternately of the Scala, the Visconti, or the Carrara families. It has since shared the vicissitudes of the rest of Venetia, and 1866 was ceded to the kingdom of Italy (q.v.).—Pop. (1881) 68,741.
(1881) 68,741; (1901) 74,271.

VERONICA, n. *vē-rŏn'ĭ-ka* [It. and Sp. *veronica:* F. *véronique*]: extensive genus of plants, whose hardy herbaceous species are admirably adapted for ornamenting flower-borders, ord. *Scrophulariăcĕæ:* see SPEEDWELL.

VERONICA, *vē-rŏn'ĭ-ka* (or BERENICE), SAINT: saint of the Rom. Cath. Church, whose history, indeed whose historical existence, has been the subject of controversy. According to the Bollandists (q.v.), V. was a woman of

Jerusalem who met the Lord Jesus on his way to Calvary; and as he was sinking overpowered by fatigue under the weight of the cross, V. offered him her veil or kerchief to wipe the sweat from his brow; when, wondrous to tell, the divine features were miraculously impressed on the cloth, and remained as a permanent picture of the face of our Lord. This miraculous picture is reported to have been preserved in Rome at St Peter's Church from about the year 700. Another, of similar appearance, is preserved at Milan; and many Rom. Cath. writers, among whom are the learned Mabillon and Papebrook, have supposed that whatever is to be said of the legend of the pious woman at Jerusalem, the name 'Veronica' is founded on an erroneous application of what in reality was meant to designate not the personage, but the picture, which was described as *vera icon* [Gr. *eikon*], 'the true image' (i.e., of Christ). Other writers, however, are of opinion that V. is a real name, and designates a real personage, though probably erroneously applied in this legend. The picture has been frequently reproduced in painting and engraving; the most celebrated in the former mode is one by the great Spanish painter Morales, surnamed 'the Divine,' from his favorite subject, which was the countenance of the Lord Jesus in the 'Ecce Homo' and similar subjects.

VERPLANCK, *vĕr-plăngk'*, GULIAN CROMMELIN, LL.D.: author: 1786, Aug. 6—1870, Mar. 18; b. New York. Having graduated at Columbia 1801, he studied law and was admitted to practice; but soon went to Europe and there spent several years. He entered the N. Y. legislature 1820; was prof. of evidences of revealed religion in the Prot. Episc. Sem., New York, 1821–25; then was representative in congress till 1833, when he entered the N. Y. senate and was senator till 1841. He was vice-chancellor of the N. Y. Univ. 1855 till his death. He published *The Bucktail Bards*, a series of political satires directed against DeWitt Clinton, mayor of New York; *Essays on the Various Evidences of Revealed Religion; Doctrine of Contracts; Shakespeare's Plays;* also several occasional essays, orations, etc. With William Cullen Bryant and Robert C. Sands, V. edited for 3 years an annual named *The Talisman.*

VERRES, *vĕr'rēz*, CAIUS: Roman pretor and governor, noted for arrogance, cruelty, and extortion: abt. B.C. 112–43. After serving as pretor at Rome, he was sent to govern Sicily, one of the richest and most prosperous Roman provinces. Thoroughly roused at the end of three years of his high-handed administration the Sicilians, having secured the powerful aid of Cicero, succeeded in bringing him to trial. He was defended by Hortensius, but before the close of the trial, after hearing the first of Cicero's orations against him, V. fled from Rome, carrying his plunder with him. He settled in Gaul near Marseilles. He was killed by the soldiers of Antony, his wealth, it is said, having excited Antony's avarice.

VERRUCA, n. *vĕr-rū'kă*, plu. VERRUCÆ, *vĕr-rū'sē* [L. *verrūca*, a wart, an excrescence; *verrūcæ*, warts]: a wart: in *bot.* in the plural, collections of thickened cells on the surface of plants, assuming a rounded form, and containing starch and other matters. VERRU'CIFORM, a. *-sĭ-fawrm* [L. *forma*, shape]: shaped like a wart or warts. VERRUCOSE, a. *vĕr'rū-kōs*, or VER'RUCOUS, a. *-kŭs* [L. *verrucōsus*, warty, rugged]: warty; in *bot.*, covered with wart-like excrescences. VERRUCULOSE, a. *vĕr-rū'kū-lōs'*, having minute wart-like prominences.

VERSAILLES, *vĕr-sālz':* city of France, cap. of the dept. of Seine-et-Oise; on a plain, 11 m. s.w. of Paris by railways on both banks of the Seine. V. was long the residence of the French court, and indeed owes its existence to the palace. A fine avenue, part of the road from Paris, divides the town into two parts. The town covers a large area, in proportion to its population, and is regularly laid out, with long and straight streets, crossing at right angles. V. is a city more of pleasure than of industry or trade: it long found its sustenance in the expenditure of a luxurious court; and was subsequently a place of residence for many foreigners, attracted by the salubrity of the climate, the fine promenades, and the economy of living, as compared with that in Paris. It is the see of a bishop, and contains a public library of 50,000 vols., many palatial edifices, public fountains, spacious squares, and elm-planted avenues; and when taste in architecture and in landscape-gardening was more formal than at the present time, the town was esteemed the handsomest in Europe. The great attraction of V. is its palace, whose history may be said to be the history of the town. The site of the palace was that of the ancient priory of St. Julien, dating from the early times of the Capetan monarchy. Later, the priory became a feudal stronghold, and its first superior, *Hugo de Versaliis*, lived in the 11th c. In 1570 the manor belonged to Martial de Léoménie, one of the victims of St. Bartholomew. The building was converted by Louis XIII. into a château; and Louis XIV. spent enormous sums in its embellishment, or rather reconstruction. Louis XV. altered the arrangement of the interior, and meditated alterations that would have changed the whole character of the edifice, but which were prevented by lack of money. Under Louis XVI., the place continued to be one of the usual residences of the court till the Revolution, which event had its beginning here in the meeting of the states-general, 1789, May. Louis Philippe transformed the palace of Louis XIV. into a museum of trophies of the victories of France. The approach to the palace is by the *Place d'Armes* and the *Cour d'Honneur:* the latter contains a large equestrian figure of Louis XIV., and other statues. The entire length of the palace is nearly 1,400 ft. The collections embrace pictures of events in French history, protraits of French heroes, etc. The most interesting are the pictures by David which illustrate the career of Napoleon, and those by Horace Vernet. The gardens, with their broad terraces and long alleys, are imposing, but

formal; the fountains are on the grandest scale. From 1870, Sep., till the conclusion of peace 1871, V. was the centre of the military operations of the Germans. Sep. 20 King William and the crown-prince entered the town; and there, 1871, Jan. 18, William was proclaimed Emperor of Germany. On Jan. 28, the capitulation of Paris was signed in V.; after the peace, it was the seat of the national assembly and govt. till 1880, and was the headquarters of the army during the Commune.—Pop. (1881) 48,012; (1886) 49,514; (1891) 51,679; (1901) 54,982.

VERSAL, a. *vėr'săl:* in *OE.*, universal.

VERSANT, a. *vėr'sănt* [L. *verso*, I transact]: familiar; conversant.

VERSATILE, a. *vėr'să-tĭl* [F. *versatile*, versatile—from L. *versātĭlis*, that turns round, movable—from *versārĕ*, to turn much or often, frequentative of *vertĕrĕ*, to turn]: that can be turned round; changeable; unsteady; easily turned from one thing to another; turning with ease from one thing or occupation to another; easily applied to a new task, or to various subjects, as a man of *versatile* genius; in *bot.*, attached by one point to the filament, and hence very easily turned round, as an anther. VER'SATILELY, ad. *-lĭ.* VER'SATILENESS, n. *-tĭl-nĕs*, versatility. VER'SATIL'ITY, n. *-tĭl'ĭ-tĭ*, aptness to change; the faculty of turning easily from one occupation, pursuit, task, or subject to another.

VERSCHAFFELTIA, n. *vėr'shăf-fĕl'tĭ-ă* [*Verschaffelt*, a Dutch botanist]: a genus of the ord. *Palmācĕæ*, comprising the species *V. splendĭda*, one of the most majestic palms in cultivation, densely clothed with long sharp spines, and having the fronds broad and entire.

VERSE, n. *vėrs* [F. *vers*, a verse—from L. *versus*, a turning, a line—from *vertĕrĕ*, to turn: It. *verso*]: a line in poetry, containing a certain number of measured syllables (see METER: RIME): *popularly*, four lines or a stanza of a piece of poetry: poetical or metrical composition; poetry: in *Scrip.*, a short division of a chapter; a similar division in any book: V. in *OE.*, to tell or compose in verse; to relate poetically. VERS'ING, imp. VERSED, pp. *vėrst.* VERSIFY, v. *vėr'sĭ-fī* [L. *versus*, a verse; *facĭō*, I make]: to form or turn into verse; to relate or describe in verse. VER'SIFYING, imp. VER'SIFIED, pp. *-fīd.* VER'SIFIER, n. *-fī-ėr*, one who versifies or turns into verse; a rhymer. VER'SIFICA'TION, n. *-fĭ-kā'shŭn* [F.—L.]: the art or practice of composing verse or poetry. VER'SIFICA'TOR, n. *-tėr*, one who versifies. VER'SICLE, n. *-sĭ-kl*, in *OE.*, a little verse—specifically one of a succession of verses or small portions of Scripture said or sung in divine service by the priest or minister alternately with another succession of short verses called the 'responses,' said or sung by the choir or congregation. VERSICULAR, a. *vėr-sĭk'ū-lėr*, of or pertaining to verse or verses. BLANK VERSE, poetry in which the lines do not rhyme with each other. HEROIC VERSE: see under HERO.

VERSECZ, *vĕr'shĕts:* town of the Temesvar county, Hungary, on the V. Mts., 40 m. s. of Temesvar by railway. It is the seat of a Greek Non-united bishop. The chief industry is the production of wine, silk, and rice: its yearly export of wine averages about five and a half million gallons. Pop. 22,000.

VERSED, a. *vĕrst* [L. *versus*, pp. of *vertĕrĕ*, to turn]: with *in*, well skilled; thoroughly acquainted; conversant with. VERSED SINE, or VERSINE, *vĕr sīn:* see SINE.

VERSICOLORED, a. *vĕr'sĭ-kŭl'ĕrd* [L. *versicŏlor*, of various colors—from *versārĕ*, to change, and *color*, color]: changeable in color; many-colored; also VERSICOLOR.

VERSIFY, VERSIFIER, VERSIFICATION: see under VERSE.

VERSION, n. *vĕr'shŭn* [F. *version*—from mid. L. *versĭō* or *versĭōnem*, a version—from L. *versus*, pp. of *vertĕrĕ*, to turn: It. *versione*, a version]: a translation or rendering of a book or passage from another language; that which is rendered or translated from another language; specially applied to translations of the Scriptures, e.g., *Septuagint Version; Revised Version* (see BIBLE): an account; a statement: in *OE.*, a change.

VERST, n. *vĕrst* [Russ. *versta*]: a Russian mile equal to 3,500 Eng. ft. or about two-thirds of an Eng. mile; spelled also WERST.

VERSUS, prep. *vĕr'sŭs* [L. *versus*, toward, turned in the direction of—from *vertĕrĕ*, to turn]: against—chiefly used in legal language, and contracted into *v.*

VERT, n. *vĕrt* [F. *vert*, green—from L. *virĭdis*, green]: in *OE. forest law*, everything that grows and bears a green leaf within the forest; in *her.*, a green color (see HERALDRY).

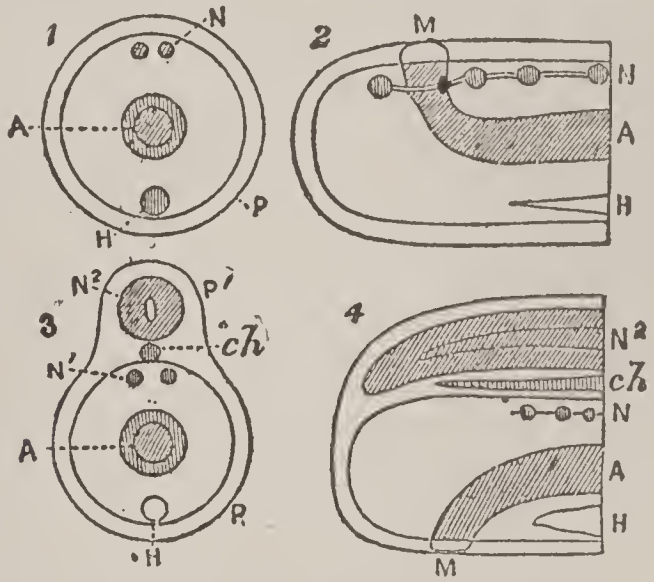
VERTEBRA, n. *vĕr'tĕ-brā*, VER'TEBRÆ, n. plu. *-brē* [L. *vertĕbra*, a joint—from *verto*, I turn]: a single bone of the backbone or spinal column of an animal, so named from its moving upon the adjoining one; one of the bones forming the spine; the different *vertebræ* are usually divided into *cervical*, or those of the neck; *dorsal*, or those of the back; *lumbar* and *sacral*, or those of the loins; and *caudal*, or those of the tail (see SPINAL COLUMN: SKELETON). VER'TEBRAL, a. *-brăl*, pertaining to the vertebræ or joints of the spine or backbone; having a backbone: N. an animal having a backbone. VER'TEBRE, n. *-bĕr*, in *OE.*, a single bone of the backbone; a vertebra. VERTEBRATE, a. *vĕr'tĕ-brāt*, or VERTEBRATED, a. *vĕr'tĕ-brā-tĕd*, having a backbone or vertebral column; in *bot.*, applied to leaves which are contracted at intervals, there being an articulation at each contraction. VER'TEBRATE, n. an animal having a backbone. VERTEBRATA, n. plu. *vĕr'tē-brā'ta*, the division of the animal kingdom characterized by the possession of a backbone or vertebræ. VERTEBRA DENTATA, *dĕn-tā'tă* [L. *dentātus*, toothed—from *dens*, a tooth]: the second vertebra or axis, forming a pivot on which the head with the first vertebra or atlas rotates.

VERTEBRATA, *vêr'tē-brā'ta:* highest and most important of the animal sub-kingdoms, containing all animals which have a backbone composed of a varying number of small bones called vertebræ (see SKELETON: SPINAL COLUMN), which composite backbone serves at once for general support of the other parts, and for protection of the central part of the nervous system (the brain and spinal cord) in a closed cavity in the interior.

We notice first the developmental, then the structural peculiarities of the vertebrates. Like the members of the other sub-kingdoms, the vertebrates begin in a semi-fluid nitrogenous substance called plasma, which separates itself (or differentiates, as it is scientifically termed) into albumen, fibrin, primary membrane (the lemma of Owen), nuclei, and cells, in which form, says the above-named physiologist, 'the individuality of the new organism first dawns as a nucleated germ-cell, or germinal vesicle.' The formation of yolk by the evolution of albuminous granules and oil-particles from the plasma, and the development of an outer layer of membrane, complete the unimpregnated egg. For further development, another principle, the spermatozoon, or product of the sperm-cell, is required. Its reception by the egg is followed by the formation of a germ-mass, which is formed by consecutive divisions, cleavages, or segmentations of the impregnated centre, which incorporates more or less of the yolk. Thus far there is no difference between the vertebrate and the invertebrate germ. The next step, to use the words of Prof. Owen, 'impresses upon the nascent being its *vertebrate* type.' The parietal portion of the germ becomes raised up on each side into a ridge, so that a long groove or furrow is formed between these parallel ridges; and the margins of these subsequently uniting with one another, constitute a tube, in the interior of which the vertebrate cerebro-spinal nervous centres are developed. In the mean time, the margins of the germs extend downward over the yolk till they meet and form the abdominal cavity. Hence, in the vertebrates, there are developed from the *chorda dorsalis*, or *notochord* (see DEVELOPMENT OF THE EMBRYO) 'a pair of plates "neurad," * to inclose the nervous axis; and a pair of plates "hæmad," † to inclose the vascular axis and organs of vegetative life. Flesh and skin co-extend with the inclosing plates. This formation of two distinct parallel cavities—neural and hæmal—under symmetrical guidance, in the vertical or "neuro-hæmal" direction, with a repetition of parts on the right and left sides, establishing transverse or "bilateral" symmetry, constitutes the chief developmental characteristics of the vertebrate animal.'—Owen's *Anatomy of Vertebrates*, I. The accompanying diagrams, from Prof. Huxley's *Elements of Comparative Anatomy*, may illustrate this subject. In the invertebrates, merely a single saccular or tubular investment is formed, which incloses all the viscera; so that, provided we select one ranking high enough to possess a

* Backward in man, upward in beasts.
† Forward in man, downward in beasts.

heart and nervous system—the transverse and longitudinal sections would be represented by 1 and 2, while P represents the parietes, or wall of the body, A the alimentary canal, M the mouth, H the heart, and N the nervous centres. 'It will be observed,' says Prof. Huxley, 'that the alimentary canal is in the middle, the principal centres of



Diagrams representing generalized sections of one of the higher Invertebrates (1, 2) and of a Vertebrate (3, 4):

1, 3, transverse; 2, 4, longitudinal section; A, alimentary canal; H, heart; P, parietes of the body; P′, parietes of neural canal; N, nervous centres of Invertebrate; N′, sympathetic, and N², cerebro-spinal centres of Vertebrate; *ch*, notochord; M, mouth.

the nervous system upon one side of it, and the heart upon the other. In none of these animals, again, would you discover in the embryonic state any partition formed by the original external parietes of the body between the nervous centres and the alimentary canal.'—But the vertebrate, after it has passed through its very earliest stages of development, is, as we have seen, not a single, but a double tube; and the 'two tubes are separated by a partition, which was, primitively, a part of the external parietes of the body, but which now lies in a central position between the cerebro-spinal nervous centres and the alimentary canal. Hence a transverse section of any vertebrated animal may be represented diagramatically by fig. 3, where, for the most part, the letters have the same signification as in the foregoing case, but where P′ denotes the second or cerebro-spinal tube. The visceral tube (P) contains, as in the case of the invertebrate animal, the alimentary canal, the heart, and certain nervous centres belonging to the so-called sympathetic system. This nervous system and the heart are situated upon opposite sides of the alimentary canal, the sympathetic corresponding in position and in forming a double chain of ganglia with the chief nervous centres of the invertebrata; so that the cerebro-spinal tube appears to be a superaddition—a something not represented in the invertebrate series. In close connection with the profound difference between the chief nerve-centres of the vertebrate and the invertebrate, is another remarkable structural contrast. In all the higher invertebrates, with

a well-developed nervous system, the latter is perforated by the gullet, so that the mouth is situated upon the same side of the body as the principal masses of the nervous system; and some of the ganglia of the latter lie in front of, and others behind, the œsophagus. A longitudinal section of such an animal may therefore be represented by fig. 2. A similar section of a vertebrated animal shows, on the contrary, the chief centre of the nervous system not to be perforated by the œsophagus, the latter turning away from it, and opening upon the opposite side of the body (fig. 4).—No structures having any analogy to the *chorda dorsalis*, or *notochord*, or to the *visceral arches* and *clefts* (see SKELETON), are found in the embryonic condition of any of the invertebrates.

Passing from the developmental to the structural differences, we have universally the vertebral column and the nervous centres, consisting of brain and spinal cord; and the organs of the five senses are usually present. All possess a distinct vascular system, containing blood, with red and white corpuscles in suspension, and in all (with the solitary known exception of the *amphioxus*, or Lancelet), there is a compact muscular heart of two or more cavities, and provided with valves. The breathing organ communicates with the pharynx. The alimentary canal has two apertures, usually at opposite ends of the trunk, the mouth or reception aperture never being formed of modified limbs, or working horizontally, as in the *Articulata*, but provided with two bony jaws, placed one above the other, and acting vertically.

All vertebrates possess a hepatic portal system, by which the blood of the alimentary canal is collected into a portal vein, which ramifies through the liver; also there is a peculiar system of vessels, the *lacteal system*, an appendage to the venous system, and consisting of a series of vessels which take up the products of digestion, and while they are undergoing partial elaboration, convey them to an entrance into the venous circulation, where they mingle with the venous blood soon to be sent to the lungs. The limbs of vertebrates may be totally absent, or may be in one or two pair, never more; while invertebrates have a greater number, and the muscles are attached to an exoskeleton. The muscles surround the bony levers on which they act, and thus, under the influence of the will, move the limbs and other parts. The sexes are distinct.

Comparative anatomists differ in their division of the vertebrates into classes, and as to the best basis of classification. Prof. Owen, in his *Anatomy of Vertebrates*, admits only four classes: Fishes, Reptiles, Birds, and Mammals; whereas Milne-Edwards, Huxley, and many leading authorities, separate the Amphibians from the Reptiles, and assign them a class by themselves. Prof. Owen, after describing the modifications of the piscine, reptilian, ovian, and mammalian types, observes that the vertebrates might be binarily divided into oviparous and viviparous: into anallantoic or branchiate, and allantoic or abranchiate: into *Hæmatothermal* [Gr. *haima*, blood, *thermos*, hot],

having four-chambered heart, spongy lungs, hot blood; and *Hæmatocryal* [Gr. *haima*, blood, *cruos*, cold], having less perfect breathing organs, less complex heart, with cold blood: and adopts the latter division. Huxley, on the other hand, after noticing the division of the vertebrates into *Branchiate* and *Abranchiate*, and pointing out the non-homogeneous character of the abranchiates—Mammals being so strongly separated from Birds and Reptiles—suggests the removal of them to an independent position. 'Thus,' he observes, 'the classes of the *Vertebrata* are capable of being grouped into three provinces: (1) The ICHTHYOIDS (comprising Fishes and *Amphibia*), defined by the presence of branchiæ at some period of existence, the absence of an amnion, the absence of a rudimentary development of the allantois, nucleated blood-corpuscle, and a parasphenoid bone in the skull; (2) the SAURIANS, defined by the absence of branchiæ at all periods of existence, the presence of a well-developed amnion and allantois, a single occipital condyle, a complex mandibular ramus, articulated to the skull by a quadrate bone, nucleated blood-corpuscles, and no parasphenoid—comprising Reptiles and Birds· and (3) the MAMMALS, devoid of branchiæ, and with an amnion and an allantois, but with two occipital condyles, and a well-developed basi-occipital, and no parasphenoid, a simple mandibular ramus, articulated with the squamosal, and not with the quadratum, with mammary glands, and with red non-nucleated blood-corpuscles.' —For a now accepted classification of the V., see ZOOLOGY.

VERTEX, n. *vĕr'tĕks*, VERTEXES, *vĕr'tĕks-ĕz*, E. plu., VÉRTICES, L. plu. *vĕr'tĭ-sēz* [L. *vertex* or *vertĭcem*, a whirl, eddy, summit, the top or crown of the head—from *verto*, I turn: It. *vertĭce*]: the highest point; top; the summit; in *anat.*, the top or crown of the head; in *geom.*, the point opposite the base in an angle, cone, etc. VER'TICAL, a. *-kăl* [F.—L.]: of or pertaining to the vertex; standing upright; placed, or being perpendicularly, over the head; straight up and down; in a position perpendicular to the plane of the horizon; situated at the vertex, top, or highest part. VER'TICALLY, ad. *-lĭ*. VER'TICALNESS, n. *-nĕs*, the state of being vertical. VERTICAL CIRCLES, great circles of the celestial concave which pass through the vertex of the visible hemisphere, and are therefore perpendicular to the horizon.

VERTICIL, n. *vĕr'tĭ-sĭl* [L. *vertĭcil'lus*, a little vertex, the whirl of a spindle—from *vertex*, a whirl, the top]: in *bot.*, a whorl or form of inflorescence in which the flowers are arranged opposite to each other in a circle round an axis, and at the same level; also VER'TICEL, n. *-sĕl*. VERTICILLATE, a. *vĕr-tĭs'ĭl-lāt*, and VERTIC'ILLATED, a *-lā-tĕd*, in *bot.*, having parts arranged in a whorl, or like the rays of a wheel. VER'TICILLAS'TER, n. *-lăs'tĕr*, a false whorl or verticil in which the cymose inflorescence in the axils of opposite leaves presents the appearence of their flowers being disposed in whorls, as in the labiate plants.

VERTIGO, n. *vĕr'tĭ-gō*, VER'TIGOES, n. plu. *-gōz*, L. plu. VERTIG'INES, *-tĭj'ĭ-nēz* [L. *vertīgo* or *vertīgĭnem*, a turning or whirling round—from *verto*, I turn about: It. *vertigine;* F. *vertige*, dizziness]: giddiness; dizziness and swimming of the head. VERTIG INOUS, a. *-ĭ-nŭs*, giddy; affected with vertigo; in *OE*, revolving. VERTIG'INOUSLY, ad. *-lĭ*. VERTIG'INOUSNESS, n. *-nĕs*, giddiness.—*Vertigo* is characterized by the sensation of being about to fall, or of turning round (subjective V.), or of surrounding objects appearing to move or turn round (objective V.). It comes on without premonitory symptoms, except a sense of disturbed balance, which may precede, accompany, or follow. Associated with it some of the following symptoms are frequently found; viz.: flashes of light before the eyes, buzzing in the ears, painful sensations in the head, nausea, vomiting, trembling with cold perspirations, muscular tremors, a full, slow, or small and frequent pulse, flushing or pallor of the face, and cold feet.

Giddiness and *dizziness* are only other names for V., though giddiness commonly denotes its milder forms. V. comes in paroxysms, usually repeated several times a day, and lasting from a few minutes to a quarter of an hour. This disease is frequently chronic, the chief predisposition to it being in middle and advanced age: childhood is nearly exempt. A plethoric constitution, especially if associated with a sedentary mode of life, the so-called change of life in women, the debility brought on by exhausting discharges, and the excessive use of spirituous liquors, may be regarded as predisposing causes. The direct cause of V. is doubtless irregularity in the supply of blood to the brain: hence any condition that occasions either increase or diminution in the supply of blood is followed by V. Thus, it commonly accompanies disease of the heart, especially hypertrophy of the left ventricle; it is also induced by suppressed hemorrhoids, or other constant form of discharge or loss of blood. Injuries and diseases of the brain, especially of the cerebellum, are often accompanied by this symptom, as also are diseases of the spleen. Among the most common exciting causes are intoxication from alcoholic drinks or from narcotics (tobacco, etc.); inhaling carbonic acid gas; semi-poisoning by belladonna, digitalis, hyoscyamus, etc.; gorging the stomach with indigestible food (especially if highly carbonated drinks are at the same time taken); unusual movements or positions of the body, and especially of the head, as in sea-voyages, continued stooping, etc.

A peculiar kind of V. occurs in dreams. The direction of the apparent movement is generally from above downward; dreams of tumbling down stairs being, according to Romberg, the most common; people also dream of sinking into the earth, of chasms opening before them, etc.

Boerhaave's statement that 'V. is the most easily cured of all the diseases of the head,' is too positive; the V. caused by profuse discharges and exhaustion is curable, but the V. accompanying cerebral disorganization is beyond the aid of treatment. The *treatment* depends on the cause; while

in some cases tonics (the mineral acids, small doses of nux vomica, quassia, etc.) are required, in others, the local abstraction of blood from the nape of the neck, cold affusion, etc., are required. The following rules are, however, generally applicable for treatment of patients subject to giddiness. They should avoid violent, continuous, or rotatory exercise, abstain from highly nutritious or heating articles of diet, and from late suppers; they should not indulge in too much sleep, or the use of feather-beds, or of warm baths. Counter-irritation to the skin by sinapisms, foot-baths with mustard, use of the flesh-brush, with cold washing of the body, and administration of cooling laxatives, are to be recommended. When the patient feels the attack coming on, Romberg directs that he should 'direct his full attention to movement. The patients do this, in a measure, of their own accord, by supporting themselves firmly with their hands and feet, in order to resist the illusory movement. The sense of vision may be employed for the same purpose; thus, the V. produced by rotatory movement of the body may be suppressed by looking steadily at the finger held up to the eye, or by turning round in a direction oppositive to the previous movement.'

Remarkable vertiginous conditions can be artificially induced. Vertical Vertigo can be produced thus: The experimenter—who must be standing—has a somewhat heavy weight attached to each hand, and as he carefully watches for some time the sensation produced by gravitation he feels the weights growing heavier and heavier, till he can no longer bear them. Then putting them down, he feels as if impelled to mount straight upward and as if the arms were shortened, and the hands must creep up to the thorax. Similar experiments with the muscles of the eye afford still more striking results. 'If the face,' says Purkinje (anatomist, whose experiments were pub. 1820–27) 'be turned to the ceiling, and the eye be fixed on a given point, round which, as the pole of a vertical axis, the body is turned a certain number of times, the visible objects of the ceiling, as well as the floor of the room, will, if the position of the head and the direction of the eyes be maintained, appear to move in a horizontal direction. If, during the proceeding, the head be brought back into the ordinary upright position, the horizontal will be turned into vertical V.; and this sensation will be communicated to the tactile sense of the hands and feet, the floor appearing to sink down on one side, and to rise on the other.

An analogous effect is produced by standing on the brink of, or in, a running stream, and fixing the eyes on the water: after a time, the sensation begins all at once of being borne along against the current. When this sensation comes on in wading in a river, it is very difficult to keep one's footing; hence it is dangerous to let the eyes rest on the current close by.

Hitherto, we have spoken of V. merely as a sensation; but there are certain morbid conditions of the brain, and certain operations which experimental physiologists can perform upon it, that give rise to what may be termed *ver-*

tiginous movements, if (as is usual with writers on this subject) we include under the term V. *straight* as well as circular movements. From experiments of Magendie and Flourens, confirmed by Krauss and Hertwig, it follows that: 1. Removal of both corpora striata of the brain induces an irresistible tendency to advance, the animal pressing straight forward; 2. Slicing the cerebellum, horizontally or vertically, causes the animal to walk backward; 3. Section of the corpora quadrigemina of one side, and of one side of the pons varolii, excites rotatory movements and gyrations of the animal toward the injured side; while division of the corresponding parts on the opposite side restores the balance. Vertiginous movements consequent on disease in sheep were described by veterinary surgeons before they were noticed in the human subject. The *Cœnurus cerebralis*, now known to be the larva of a species of tapeworm (*Tænia cœnurus*) infesting the dog, is the well-known hydatid in the brain of sheep, producing in that animal the disease known under the various names staggers, turn-sick, goggles, rotatory disease, etc. How this hydatid excites these movements when it destroys certain parts of the brain, is now explained by the experiments above noticed.—See remarks of Dr. Carpenter (in criticism of some of Magendie's conclusions) on the Cerebellum and its Functions, in his *Human Physiology*.

VERTU, n. *vér'tô* [It. *vertù*, virtue, worth]: used in the phrase ARTICLES OF VERTU, objects of artistic value, antiquarian curiosities, etc.; spelled also VIRTU (q.v.).

VERTUE, *vér'tū*, GEORGE: English engraver and antiquary: 1684–1756, July 24; b. London. At the age of 13 he was apprenticed to a French heraldic engraver in London; subsequently he worked seven years as pupil of Michael Vandergucht; and 1709 began business for himself. He was generously befriended by Sir Godfrey Kneller, the great portrait-painter. V.'s talent soon made itself recognized; and his eminent success in an engraved portrait of Abp. Tillotson, placed him in the front rank of his profession. He reproduced portraits by Kneller, Richardson, and one or two others of the more eminent painters of the day; and he issued a large engraved head of George I., which had an immense sale. Meanwhile, having long applied himself to antiquarian research, he was appointed, 1717, engraver to the Soc. of Antiquaries. He lies buried in the cloisters of Westminster Abbey.—V. was a man of various accomplishments, artistic and linguistic. He projected a *History of the Arts in England;* and had accumulated masses of material for it, which, at his death, were bought by Walpole, who made free use of them in his *Anecdotes of Painting in England*. In a supplementary vol. of that work, entitled *A Catalogue of Engravers, etc.*, is a full list of V.'s works; with notices of his character, whose genuine worth is indicated in an expression of respect from the frequently caustic and supercilious Walpole.

VERTUM'NUS: see POMONA.

VER'ULAM: see BACON, FRANCIS (Lord Verulam).

VERULAMIAN, a. *vĕr-ū-lā'mĭ-ăn* [L. *Verulamium*, the ancient name of St. Albans]: of or pertaining to St. Albans, or to Francis Bacon, Lord Verulam.

VERVAIN, n. *vĕr'vān* [F. *verveine*—from L. *verbēna*, the bough of a laurel, olive, or myrtle]: plant of genus *Verbēna* and order *Verbenaceæ* (q.v.); a sacred plant among the Greeks, and held in superstitious reverence by the Druids. —*Vervain* has a 5-cleft calyx, one division a little shorter than the rest, limb of the corolla irregularly 5-lobed, stamens (4 or 2) included within the corolla, fruit a 4-seeded utricle, which soon breaks, so that the ripe fruit consists of four adherent achenia. The species are herbaceous plants and small shrubs, with undivided, trifid, or multifid leaves, natives chiefly of warmer temperate parts of the world. The Common V. (*V. officinalis*), perennial plant, with erect somewhat hispid stem, rough lanceolate inciso-serrate or trifid and laciniate leaves, and filiform spikes of pale lilac flowers, is a native of Europe, and somewhat naturalized in the United States, southward. It is a common ornament of flower-borders, continuing to blossom all summer. It had formerly very high reputation as a medicinal plant, but its virtues are now regarded as imaginary. A number of species of V., chiefly Amer. and E. Indian, are occasionally cultivated for the beauty of their flowers. The Blue V. (*V. hastata*), 4–6 ft. high, is common in the United States; the White V. has small flowers; the Hoary V., with large blue flowers, has downy leaves; the Bracted V., of the w. and s.w. has small purple flowers; and *V. Aubletia*, an annual with large light purple flowers, of the w. and s., is cultivated. Our species have numerous spontaneous hybrids.

VERVE, n. *vĕrv* [F. *verve*, rapture, animation—from mid. L. *verva*, a ram's head sculptured, then a fanciful sculpture, caprice of fancy of an artist]: spirit; imagination; energy; mental excitement or enthusiasm; rapture; animation.

VERVELS, *vĕr'vĕlz*, or VAR'VELS, *vâr'-*: small rings attached to the ends of the jesses of a hawk, through which the leash is passed that fastens the hawk to its block: they occur as a heraldic charge.

VERVICK, or WERVICQ, *vĕr'vĭk:* town of Belgium, province of W. Flanders, near the French frontier, on the Lys, 8 m. s.e. of Ypres.—Pop. about 8,000.

VERVIERS, *vĕr-vē-ā':* manufacturing town of Belgium, prov. of Liége; picturesquely situated on the river Vesdre, 15 m. e.s.e. of Liége, on the Brussels and Cologne railway. It is of recent growth, and consists almost wholly of workshops and of the dwellings of the manufacturers and their workmen. V. is the great centre of cloth-manufacture in Belgium; the total product being valued at about $16,000,000 annually. In and around the town are 60 cloth-mills, employing 40,000 persons and 155 steam-engines. The exports of cloth are chiefly coarse woolens, which are said to be better and cheaper than those of either France

or Great Britain. The waters of the Vesdre are thought to have qualities especially fitted for dyeing. Pop. (1884) 43,791; (1891) 49,552; (1901) 49,353.

VERY, a. *vĕr'ĭ* [OE. *verray*—from OF. *verai;* F. *vrai*, true—from L. *vērax* or *vērus*, true]: true; real; actual; perfect; the same, emphatically: AD. in a great or eminent degree. VER'ILY, ad. *-lĭ*, in truth; really; certainly.

VESALIUS, *vē-sā'lĭ-ŭs*, ANDREAS: termed the 'founder of human anatomy': 1514–64; b. Brussels. He studied classics at Louvain, and anatomy and medicine at Cologne, at Montpellier, and finally at Paris. So keen was his love of dissection, that to procure subjects (at that time no easy matter) he ran considerable risks at the hands of the municipal authorities. Driven from Paris by the outbreak of war between Francis I. and Charles V., he returned to the Low Countries, where he served as physician and surgeon in the imperial army 1535–37. In 1539 he went by invitation to Pavia, where he taught anatomy till 1543. From Pavia he went, again as lecturer in anatomy, to Bologna and Pisa; and 1544 was made physician-in-chief to Charles V. at Madrid, where mainly he continued to reside. His prosperity had a sudden end. A Spanish gentleman died 1564 whose relatives granted V. permission to dissect the body. Life, however, was ascertained to be not quite extinct when V. began the operation, the heart being found still palpitating. The family of the deceased, with inconsiderate vindictiveness, arraigned V. before the Inquisition, and some terrible sentence would have been passed on him but for the interposition of Philip II., who procured for the unfortunate anatomist the milder penalty of an injunction to go on pilgrimage to the Holy Land. V., accordingly, in the train of the Venetian Gen. Malateste, proceeded to Cyprus, and thence to Jerusalem. While sojourning in that city, he was invited to occupy the chair of anatomy just vacated in Padua by Fallopius. It is supposed that, in compliance with this invitation, he embarked for Europe; but the ship in which he sailed was wrecked on the shore of Zante; and, overcome by hunger and misery of mind, he died in a village of that island.

V. greatly contributed to disenthral the minds of his contemporaries from their servile belief in the ancients. Galen was then to anatomy what Aristotle was to logical method; and the youthful V. assailed Galen's authority, not with rash self-confidence, nor mere reformatory zeal, but on the solid basis of independent researches into nature. His first great publication was a series of anatomical tables, *Suorum Librorum de Corporis Humani Anatome Epitome* (Basel 1542 fol.). The plates, from drawings by the best masters, and engraved on wood, were nearly all reincorporated in his great work *De Corporis Humani Fabrica Libri Septem* (Basel 1543). Great value is placed on the earliest impressions of these plates, whose explanations, however, were revised by V. in his 2d ed. (Basel 1555). He pub. 1546 his severe attack on the errors of Galen's anatomy, the well-known *De Radicis Chinæ usu Epistola.*

The cause of Galen was then espoused by Galen's disciple Fallopius, to whom V. replied in his trenchant *Anatomicarum Gabrielis Fallopii Observationum Examen* (1561). After his death, a work entitled *Chirurgia Magna*, pub. under his name, but really a compilation from the ancient anatomists, was edited by his disciple Borgarucci. The great edition of V.'s works appeared with fine plates at Leyden 1725, 2 vols. fol., under superintendence of Boerhaave and Albinus.

VESANIA, n. *vē-sā'nĭ-a* [L. madness]: in *mental pathol.*, derangement of the intellectual and moral faculties without coma or fever. Some nosologists include under this term different kinds of mental alienation.

VESICANT, n. *vĕs'ĭ-kănt* [L. *vēsīca*, the bladder in the bodies of animals, a blister: It *vescica;* F. *vessie*, bladder]: in *med.*, a substance that raises blisters on the skin: ADJ. producing a blister. VESICA, n. *vē-sī'kă*, in *anat.*, the bladder. VES'ICAL, a *-ĭ-kăl*, pert. to a vesicle; pert. to or in relationship with the bladder. VES'ICATE, v. *-kāt*, to blister; to raise blisters on. VES'ICATING, imp. VES'ICATED, pp. VES'ICA'TION, n. *-kā'shŭn*, the process of raising blisters on the skin. VESICATORY, n. *vĕs-ĭk'ă-tĕr-ĭ*, a blistering application: ADJ. blistering; having the property of raising a blister on the skin. VES'ICLE, n. *-ĭ-kl*, or VES'ICULE, n. *-kūl* [F. *vésicule*—from L. *vēsīcŭla*, a little bladder]: a small bladder-like tumor in an animal body; any small membranous cavity in animals or plants. VESIC'ULA, n. *vĕs-ĭk'ū-lă*, in *bot.*, a little blister composed of cells. VESICULAR, a. *vĕs-ĭk'ū-lĕr*, or VESIC'ULATE, a. *-ū·lāt*, or VESIC'ULOUS, a. *-lŭs*, pert. to or consisting of vesicles; having little bladders or cell-like cavities. VESICAL DISEASES: see BLADDER: URINE: CALCULUS: LITHOTOMY: LITHONTRIPTICS: ETC.—*Vesicants* or blistering agents are substances which, if kept in contact for some time with the surface of the body, excite such irritation as to cause effusion of serum from the true skin, leading to separation and elevation of the cuticle, and formation of a vesicle or blister. Vesicants are employed: (1) For relieving or removing the diseased condition of some internal part, by producing a determination of blood from the interior to the surface over the seat of the affection: (2) As general stimulants to the system, often beneficial in advanced stages of low continued fever: (3) For the direct purpose of withdrawing serum from the vascular system, for which they are prescribed with advantagein cases of sudden effusion into the pericardium or the pleura; blisters for this purpose should be of large size, and should be kept in contact with the skin sufficiently long to produce their full effect (24 hours being in some persons necessary): (4) For removing the cuticle, to permit the direct application of various medical agents (especially mercury and morphia) to the absorbing surface of the true skin. In infancy and childhood, these agents must be used with extreme caution.

To produce vesication, *Cantharidine* (q.v.)—active principle of *Cantharides*, or Spanish Flies—in one of its various forms, is generally employed, though other substances

also are used. Cantharidine is a white crystalline substance, extracted from the powdered insects by rectified spirit, and whose composition is represented by the formula $C_5H_6O_2$. It is a very active poison, and produces immediate inflammation of the skin wherever it comes in contact with it, is very volatile even at ordinary temperatures, and is soluble not only in alcohol, but also in chloroform, ether, strong acetic acid, and many oils. This substance is employed in the form of plaster (*Emplastrum Cantharidis* of the *U. S. Pharm.*), blistering liquid (several excellent forms—e.g., *Acetum Cantharidis*, *Æther Cantharidis*, and *Collodion Cantharidis*), and blistering tissue (several forms, known as *Tela vesicatoria*, *Charta ves.*, *Blistering Cloth*, *Blistering Paper*, etc.). Although the fluids and tissues are the cleaner and neater preparations, the old-fashioned *Cantharides Plaster* is most used in general practice; and is by many of the authorities (e.g., Prof. Lister) considered the most efficacious. In preparing a blister, it is expedient to sketch the desired shape and size; and before applying it the skin should be well washed with warm water. If the patient's skin is not easily acted upon, the part should be sponged with vinegar; but if it is very susceptible, and he is liable to strangury from the application of blisters, a piece of tissue-paper should be placed between the skin and the plaster. (Under the term plaster are included the blistering substance and the material—wash-leather, soft brown paper, etc.—on which it is spread). To insure close contact with the skin, the blister should be gently warmed, carefully applied, avoiding creases, and kept in its place by a bandage; and to produce its full action, it should be kept on for 10–12 hours. If, on removal after that time, full vesication has not been produced, a hot bread-and-water poultice will often produce the desired effect. The raised cuticle should be punctured, to allow of the escape of the serum (except in the case of children and persons of very irritable skin, when the vesications should be left unopened), and a dressing of simple ointment or spermaceti ointment on soft rag applied, and repeated in 24 hours; or the part may be at once covered with cotton-wool, which can remain till the skin is healed, except that it is changed when it gives off a bad odor. The troublesome *itching* which often follows application of a blister, is best relieved by a bread-and-water poultice, moistened with the dilute solution of acetate of lead, formerly known as Goulard's *Vegeto-mineral Water*. Neligan speaks highly of *Collodium Vesicans* as a blistering agent: it is prepared by mixing equal parts of collodium and cantharidal ether (obtained by digesting for three days one part of coarsely powdered cantharides in two parts of sulphuric ether, and expressing). It possesses the advantage that its strength can be readily increased or diminished; also it is easily applied in the neighborhood of joints, etc. It is applied with a camel-hair pencil; two scruples are sufficient to blister a surface as large as the palm of the hand. It is

preferable to apply the quantity to be used twice, instead of at one time, on the place to be blistered.

When a blistering agent with very rapid action is required, as in the state of collapse in cholera, recourse may be had to the application of boiling or nearly boiling water to a portion of the abdomen, the surrounding surface being protected by a wall of damp cloths. *Cold water* may be used as efficiently as boiling water: a piece of bibulous paper (common blotting-paper, e.g.) should be soaked in cold water, applied to the part to be vesicated, and covered with three or four folds of dry paper. A common smoothing-iron heated to 212° is then pressed three or four times over all; and on removing the paper, the part will be found vesicated. In less urgent cases, e.g., retrocedent gout showing itself internally, an almost immediate blister may be produced by saturating a piece of lint in the strong solution of ammonia, and applying it to the skin with moderate pressure. By the time the ammonia has evaporated, the required result is usually obtained. When it is desired to keep up a discharge from a blistered surface (instead of healing it, as is commonly required), or to produce a *perpetual blister*, the raw surface is dressed with irritants of various kinds, such as savine ointment, *Papier d'Albespeyres*, etc. At each fresh dressing (in summer twice a day), the part should be cleansed with warm water.

VESICA PISCIS, *vē-sī'kâ pĭs'ĭs* (literally, a fish's sound or swimming-bladder): the ovoid aureole or glory (formed by the intersection of two circles having a common radius), which, in the religious symbolism of the early middle ages, is often represented encircling the whole body of the Lord Jesus. This form is supposed to have been gradually evolved out of the figure of the fish, prominent in the symbolism of the early Christians on sarcophagi and elsewhere, and whose use arose out of an anagram on the initial letters of *Ἰησοῦς Χριστὸς Θεοῦ Υἱὸς Σωτήρ*, Jesus Christ, Son of God, Saviour: these initials formed the Greek word *ἰχθύς* (fish): for interesting details concerning the use of the *fish* as a secret emblem in the early church, see Smith and Cheetham's *Dic. of Christian Antiquities*—article 'Fish.'—The V. P. is much used in painted glass; and became from the 12th c. the almost invariable form of the seals of ecclesiastical persons and institutions.

VESOUL, *vĕh-zôl':* small town in e. France, cap. of the dept. of Haute-Saône; in a fertile and picturesque country, overlooked by the mountain Motte-de-V.; on the Durgeon, 147 m. e.s.e. of Paris. The manufactures are unimportant, but the environs are fertile and beautiful; the slopes of the Motte-de-V. are clad with vines; and a trade in grain, hay, and hides is carried on. Pop. (1886) 9,602.

VESPASIAN, *vĕs-pā'zhĭ-an,* TITUS FLAVIUS VESPASIANUS): Roman emperor, 10th of the 12 Cæsars: A.D. 9—79 (reigned 70–79); b. at Reate, in the Sabine country; of humble origin. After serving with distinction in Thrace, Britain, and Africa, he was sent (A.D. 67) by Nero, to conduct the Jewish war. This appointment he owed to his recognized merits, for he was not a favorite with the emperor, whom he had offended by falling asleep during the recitation of one of his poetical compositions. He conducted the war with vigor, reduced Judea, and finally laid siege to Jerusalem. At this time occurred the struggle for the imperial dignity between Otho and Vitellius, after the murder of Galba. The legions serving in the East were indignant that the empire should be disposed of at the will of the Pretorian guards. Their own general was proclaimed emperor, and quickly acknowledged as such by all the East, and, after the death of Vitellius, by Italy and all the provinces. Leaving his son Titus to prosecute the siege of Jerusalem, V. repaired to Rome, where he was joyfully received, and immediately set about the work of restoring order. He kept his soldiers under firm discipline, reformed abuses in the civil administration, co-operated cordially with the senate in improving the finances, and did much by the example of his plain and simple life to lessen the ill effects of the prodigality and luxury of his predecessors. From an interesting biography of V. by Suetonius, we are enabled to estimate clearly the character of the man. He was unostentatious in his mode of life, too shrewd to listen to flattery, liked a joke, was good-humored and easy of access. He was charged with being avaricious; but though at times he seems to have sought money by ways unusual with Roman emperors, and was economical in personal expenditure, he was lavish in embellishing the city with public works, a munificent patron of the arts and sciences, and liberal in aiding impoverished senators, and cities desolated by natural calamities. In A.D. 70 (soon after the beginning of his reign) his son Titus captured Jerusalem, and the 'peace of Vespasian' ensued. V. is chargeable with one or two acts of cruelty against insolent enemies; but usually he bore provocation with great good-temper. His son Titus succeeded him, and another son, Domitian, succeeded Titus.

VESPER, n. *vĕs'pĕr* [OF. *vespre*—from L. *vesper;* Gr. *(h)esperos,* the evening, the evening star: It *vespero:* F. *vêpre*]: the evening: the name given to the planet Venus when she appears after sunset. VES'PERS, n. plu. *-pĕrz,* 6th of the canonical hours of the Rom. Cath. Breviary, whose service begins at about 6 P.M. It is a service of very ancient use, being plainly referred to in the apostolical constitutions, and is noticeable as that one among the canonical hours which in the Rom. Cath. Church continues to be regularly sung as one of the ordinary public services of parish churches, no less than in cathedrals, where all the 'hours' are chanted. It resembles lauds, and consists of five psalms and antiphons, a lesson, a hymn with versicle and response, a canticle (the Magnificat), and a collect or

prayer. The psalms sung at vespers are Ps. cix.—cxlvii., which are distributed over the several days of the week. The service of vespers has given occasion to some of the most brilliant efforts of modern musical composers. The Evening Prayer of the Anglican Prayer-book corresponds partly with the vespers, partly with the compline (*completorium*) of the Roman Breviary. VES'PER, a. relating to the evening or service of vespers. VES'PERTINE, a. *-pĕr-tĭn*, pert. to the evening. SICILIAN VESPERS: see SICILIAN.

VESPERTILIONIDÆ, *vĕs-pĕr-tĭl-ĭ-ŏn'ĭ-dē:* family of bats, of which the type genus is *Vespertilio.* The V. belong to the naked-nosed division (*Gymnorhina*) of insectivorous small-winged bats. Like all the *Gymnorhina* division, the V. have no nasal appendage such as is seen in the *Histiophora* or leaf-nosed division; and they differ from the blood-sucking bats in the character of the digestive organs and in the dentition. They are distinguished from the rest of the *Gymnorhina* by certain special characters of teeth and skull, and by having the tail inclosed in a voluminous interfemoral membrane. There are many genera, represented by 150 species of small bats found all over the world. Some naturalists divide V. into 2 subfamilies, *Vespertilioninæ* and *Nycticejinæ.*

VESPERTINE, n.: in *geol.*, the term applied to the 13th series of the Appalachian strata, corresponding to the lowest Carboniferous group of Europe. In Penn. the greatest thickness exceeds 2,000 ft.

VESPIARY, n. *vĕs'pĭ-ĕr-ĭ* [L. *vespa*, a wasp]: the nest or habitation of insects of the wasp kind.

VESPIDÆ, n. plu. *vĕs'pĭ-dē* [from L. *vespa*, wasp]: family of hymenopterous insects of which Vespa is the type: see WASP.

VESPUC'CI, AMERIGO: see AMERIGO VESPUCCI.

VESSEL, n. *vĕs'sĕl* [OF. *vaissel, veissel, vessel*, a ship—from mid. L. *vascellum;* L. *vascŭlum*, a small vessel—from *vas*, a vessel: It. *vascello*]: a utensil for holding something, as a cup, a kettle, a barrel, etc.; a hollow structure made to float on water; a ship in general; any tube or canal for containing a liquid, as the blood in animals and the sap in vegetables, hence blood-*vessels*, sap-*vessels;* in *Scrip.*, a name applied to persons regarded as receivers or holders of something, as, '*vessels* of wrath.' LATICIFEROUS VESSELS, vessels in plants consisting of branched tubes filled with a milk-like liquid. PITTED VESSELS, dotted ducts, common in plants, which contain numerous incomplete pores. SPIRAL VESSELS, vessels consisting of very long tubes clustered together, and each having a spiral fibre or fibres in its interior.

VESSIGNON, n. *vĕs'sĭg-nŏn* [F. *vessigon*—from L. *vēsīca*, a bladder, a blister]: a soft swelling on a horse's leg; wind-gall.

VEST, n. *vĕst* [F. *veste*—from L. *vestis*, a covering for the body: akin to Gr. *esthēs*, clothing: Skr. *was*, to be clothed]: an outer garment; a vestment: hence, garb or array; specially, a body-garment without sleeves, worn by men under the coat, or a somewhat similar garment worn by women; a waistcoat: V. to clothe; to cover or encompass closely; to furnish with; to invest, as with authority or right; in *law*, to put in possession of; to take effect, or descend to, as a title or right, with *in*. VEST'ING, imp.: N. material for waistcoats. VEST'ED, pp.: ADJ. clothed or arrayed; fixed; not in a state of contingency, as *vested* interests. VEST'IARY, n. *-ĭ-ĕr-ĭ*, a robing-room or place for keeping clothes. VEST'MENT, n. *-mĕnt*, something put on; an outer robe. VESTURE, n. *vĕst'ūr* or *-chûr*, a garment; dress; clothing; covering. VES'TURAL, a. *-tū-răl*, or VEST'-IARY, a. *-ĭ-ĕr-ĭ*, of or pertaining to dress. TO VEST IN, to put in possession of; to clothe with. TO VEST WITH, to clothe; to invest with, as legal power. ECCLESIASTICAL VESTMENTS, the garments (other than the cassock and their ordinary clothes) worn by clergymen, etc., in performance of their sacred functions—including the alb, amice, chasuble, cope, maniple, rochet, stole, surplice, etc. (see VESTMENTS, SACRED).—SYN. of 'vest, n.': vesture; vestment; garment; robe; dress; waistcoat; attire; costume; habit.

VESTA, n. *vĕs'tă* [L. *Vesta*, the goddess Vesta: Gr. *(h)estĭa*, a fireplace or hearth, the goddess Vesta]; among the *anc. Romans*, the goddess of the domestic hearth and of fire, corresponding to the Greek *Hestia* (q.v.), worshipped as the patroness of chastity and of domestic union and happiness: one of the asteroids, discovered at Bremen by Olbers, 1807: a match or wax-light ignited by friction. VES'TAL, n. *-tăl*, one of the six virgin priestesses of Vesta (see below); a virgin; a woman pure and chaste: ADJ. pert. to Vesta; chaste; undefiled.—The worship of *Vesta* was the embodiment of an idea deeply rooted in the Latin, particularly in the Roman mind—viz., that the state was one great family. As the Lares were the tutelary guardians of the individual household, so the Penates and Vesta watched over the welfare of the state. The Greek *Hestia* (hearth) is a kindred conception. Each community had its public altar to Vesta—the central one for the whole Latin people being at Lanuvium, about 20 m. from Rome, on the Appian Way, where the Roman consuls and other officers offered sacrifices on entering upon their offices. The common hearth of the Greeks was at Delphi. There was also a temple of Vesta at Rome, in the Forum near the temple of the Penates (see LAR, etc.), between the Palatine and Capitoline hills; it was open during the day, and closed during the night. On March 1 in each year, the sacred fire was renewed; on June 9 the *Vestalia* were held in honor of the goddess; and June 15 the temple was cleared out, and the dirt carried into a narrow lane (*angiportus*) behind the temple, entrance to which was barred by a locked gate, through which none might enter.

The goddess herself was a virgin, and her fire was carefully tended night and day by the *Vestal* virgins, originally

four in number, but two were subsequently added. At first they were chosen by the kings; but after the expulsion of the kings, by the Pontifex Maximus, who, when a vacancy had to be filled, selected 20 damsels from six to ten years of age, and from these one was chosen by lot. The necessary qualifications for the office of Vestal were, that the maiden should be the daughter of free-born parents, then living and resident in Italy, and engaged in no dishonorable occupation; that she herself should not be younger than six, nor older than ten years, and free from physical defect. The priestess was bound to the service of Vesta for 30 years, the first 10 being occupied with learning her duties, the next 10 in performing them, and the last 10 in teaching them to others. On entering office, the Vestal took on herself a solemn vow of chastity for thirty years; violation of this vow carried with it the punishment of being buried alive in a subterranean vault near the Colline Gate, to which she was carried on a bier, as if dead, and where she found a light, with scanty supply of bread, water, milk, and oil, after whose exhaustion she perished. Violation of the vow was very rare. The chief duty of the Vestals was to keep the fire on the altar of the goddess ever burning; they had also to present offerings to Vesta, sprinkle the temple every morning with water drawn from the Egerian well, and guard the sacred relics, which were a pledge granted by fate for the permanency of the Roman sway. As the extinction of the sacred fire was deemed emblematic of the extinction of the state, the Vestal who, by neglect of duty, allowed this to happen, was severely punished, the penalty being that she should be stripped and scourged by the pontifex in the dark: the fire was again rekindled by the friction of two pieces of wood from a 'lucky tree.'

As a compensation for the strictness of the lives which they had to lead, the Vestals had many remarkable privileges—e.g., they were entirely freed from paternal authority, and indeed from the sway of most of the Roman laws; they could make a will, and give evidence without taking an oath; they had a seat assigned them in the best part of the theatre; they lived in great splendor, and were held in semi-royal honor, and received homage from the highest officers of the state; and even the plebs, in their most reckless moments, respected them. They seem to have had very great influence in many official appointments. If the eye of a Vestal should chance to light on a criminal on his way to execution, she had power to pardon him, if the meeting were accidental. At the expiration of the period of service, a Vestal, if she chose, could marry, though to do so was considered very unlucky.

VESTERAA'LEN ISLANDS: see LOFODEN.

VESTIBULE, n. *vĕs'tĭ-būl* [F. *vestibule*—from L. *vestibŭlum*, a fore-court: It. *vestibulo*]: the porch or entrance into a house; a large open space before the door, but covered; an antechamber; a passage; a hall. VESTIBULUM, n. *vĕs-tĭb'ū-lŭm*, a vestibule. VESTIBULAR, a. *vĕs-tĭb'ū-lĕr*, pertaining to or resembling a vestibule.

VESTIGE, n. *věs'tĭj* [F. *vestige*, a footstep, a trace—from L. *vestigĭum*, a footprint: It. *vestigio*]: a track; a mark left in passing; a footprint; the remains or traces of something that has passed away: plu. VES'TIGES, *-ĕz.*—SYN. of 'vestige': trace; sign; token; footstep.

VEST'MENTS, SACRED: distinctive outer garments worn by ministers of religion in the discharge of their office. The use of a distinctive costume in public worship formed a part of the Jewish, and of almost all the ancient religions, and has had place in greater or less degree in the religions of the modern world (see Lipsius, *De Monument. et Exemp. Polit*, l. i. c. 3). Ex. xxviii is wholly given to a description of the V. of the Jewish high-priest; and the directions for those of the inferior functionaries are almost equally minute. Whether the same characteristic was carried into the early Christian worship, has been a subject of controversy; many writers seeing ground for the opinion that the costume in use among Christian ministers from a very early period was not originally distinctive of an order or orders of clergy, but was simply the ordinary costume of Rome and of the East in the first centuries, becoming distinctive of sacred ministers, because by them it was retained unaltered, whereas in the every-day world the costume varied in fashion, in material, in color every few years. However the use may have originated, there is little doubt that from an early time Christian ministers used some distinctive dress in public worship; and Rom. Cath. writers find traces in the beginning of the 5th c. of the practice of blessing the V. destined for the public services of the church: see Binterim, *Denkwürdigkeiten*, IV. i. 198. From the 8th c. the rituals of the West all contain formularies for the blessing of the V. worn by bishops, priests, deacons, etc.—The V. used in celebration of the mass by Rom. Cath. priests are six in number—(1) the amice, a square piece of linen, worn on the shoulders, and in some religious orders, over the head, which latter appears to have been the ancient mode; (2) the alb, a long, loose-sleeved, linen gown, sometimes richly embroidered or 'apparelled' at the lower border; (3) the cincture, a linen cord tied around the waist, and confining the folds of the alb; (4) the maniple, a narrow strip of embroidered silk, pendent from the arm; (5) the stole, a long narrow scarf, similarly embroidered, and worn by priests around the neck, the ends being crossed over the breast or pendent in front, and worn by deacons transversely over one shoulder; (6) the chasuble, a loose flowing vestment, open at the sides, having a hole in the centre, through which the head passes, and falling down over the breast and back to some distance below the knees (for these V., see the respective titles—especially CHASUBLE: STOLE: SURPLICE). The three last named are always of the same material and color; but this color, which appears primitively to have been in all cases white, now, and for many centuries, varies according to seasons and festivals, five different colors being employed in the cycle of ecclesiastical services—white, red, green, violet, and black. Cloth of

gold, however, may be substituted for any of these, except the last. A cap, called *biretum*, is worn in approaching the altar, but is laid aside during mass. Besides these V. for priests during the mass, bishops in the same service use also two inner V., of nearly the same form as the chasuble, called 'dalmatic' and 'tunic,' also embroidered gloves and shoes, or buskins, together with the distinctive episcopal ornaments—the pectoral cross, the Mitre (q.v.), the pastoral staff, or, if archbishops, the Crosier (q.v.), and ring. Archbishops celebrating mass wear also the Pallium (q.v.). Deacons, at the same service, wear a robe, called dalmatic; and sub-deacons, a tunic. The sub-deacon is not privileged to wear the stole. In other public services, priests and bishops wear a large flowing cloak, called cope (Lat. *pluviale*), with a pendent cape or hood, called orfrey. In the ministration of the other sacraments, also in administering communion, priests wear the surplice (which is but a short alb) with the stole.—The V. of the Greek priests differ considerably in general character and effect from those of the Latin clergy, though the several portions of the costume are substantially the same as those of the Latin costume already described. The *stoicharion*, the *zoné*, the *orarion*, the *epimanikia*, and the *phelorion*, correspond respectively with the alb, cincture, stole, maniple, and chasuble. Greek bishops wear the *omophorion*, which corresponds with the later pallium. The *phelorion*, however, is so ample in its folds as to resemble the Latin cope rather than the chasuble; and the general effect of the Greek V., as of the Eastern rites in general, is more picturesque.

The natural effect of the Reformation in the 16th c. was to put aside the costume at the same time and on the same grounds with the ceremonies of the existing worship. This was done, however, by the different churches of the Reformers in very various degrees. The Calvinistic worship may be said to have nearly dispensed with V.—The Lutherans generally retained with the cassock the alb, and in some countries the chasuble.—In the Anglican Church, practice has been various: for disputes about the use of the Surplice, see that title. As to the rest of the costume, the first Prayer-book retained the Roman vestments with little change; and as, by a remarkable accident, the rubric of this Prayer-book has never been formally repealed, a ritualistic movement in the English Church has reintroduced in some places almost every detail of the Roman costume in the communion and other services—an innovation which has in many instances been vigorously resisted, but which has had gradually increasing success: see RITUALISM.

VESTRY, n. *vĕst'rĭ* [F. *vestiaire*, a robing-room—from L. *vestiārĭum*, a wardrobe—from *vestis*, a garment (see VEST)]: apartment attached to a church in which the ecclesiastical vestments are kept; apartment for parochial meetings: in the Church of England, an assembly of the inhabitants of a parish for deliberating on parish affairs (see PARISH): a committee elected annually in a parish to manage its temporal affairs in conjunction with the churchwardens. SELECT VESTRY, a smaller body deputed to rep-

resent the larger vestry. VEST'RYMAN, n. the member of a vestry.—In the Prot. Episc. Chh. in the United States, the temporal affairs of each church or parish are administered by a board called the V. or the V. board, whose members are usually chosen annually; but the mode of electing them, the sphere of their functions, and the time of election differ in different dioceses. It is usual, however, to hold the election for vestrymen at Easter: the wardens, who are associated with the V. in administering the temporalities of the church, are chosen at the same time, and for the same term. The V. has no voice in the conduct of the spiritual affairs of the parish, and no control of the rector as regards the church services, his doctrine, etc. When a church is vacant, the V. represents the parish in its relations to the bp., the diocese, the diocesan convention, etc. It elects a clergyman for rector of the parish, and nominates him to the bishop—the bishop's approval being requisite to the election taking effect.

VESTURE: see under VEST.

VESUVIAN, a. *vĕ-sū'vĭ-ăn:* pert. to *Vesuvius* (q.v.), volcano near Naples: N. reddish-brown mineral of the garnet family—found in volcanic rocks and frequently ejected in masses from Vesuvius (q.v.), whence the name; called also *idocrase, pyramidal garnet,* and *vesuvianite;* hardness nearly equal to that of quartz; colors various—yellow, green, brown, almost black, rarely azure. V. is composed of silica, alumina, and lime, in somewhat varying, but not very unequal proportions, with a little oxide of iron and oxide of manganese. It is employed as an ornamental stone, but is not very highly valued. The green-colored varieties are known as *Volcanic Chrysolite,* and the brown as *Volcanic Hyacinth.*—The name V. is applied also to a kind of fusee used by smokers in lighting cigars, etc.

VESUVIUS, *vĕ-sū'vĭ-ŭs:* celebrated volcano; near the e. shore of the Bay of Naples; about 10 m. from the city of Naples. It is a solitary mountain, rising majestically from the plain of Campania, having at the base a circumference of about 30 m., and dividing into two summits, Somma and V. Proper. The height of the mountain and form of its apex are subject to frequent changes by eruptions. It is estimated to be at present nearly 4,000 ft. high. In the single eruption of 1822, it lost 800 ft., nearly all of which has been restored by subsequent eruptions. Before that event, the summit was a rough and rocky plain, covered with blocks of lava and scoriæ, and rent by numerous fissures, from which clouds of smoke came forth. But it was then altered to a vast elliptical chasm, three m. in circumference, three-quarters of a m. at the greatest diameter, and about 2,000 ft. deep.

The first recorded eruption took place A.D. 79. Warnings had been given 16 years before by a great earthquake, which shattered the cities of Herculaneum and Pompeii, and the earth was frequently shaken by slight shocks until 79, Aug., when they became more numerous and violent.

Previous to this, V. was not suspected to be a volcano. Its sides were covered with famous vines, and its ancient crater, partly filled with water, formed the stronghold of the rebel chief, Spartacus. The morning of Aug. 24 brought comparative repose; but in the course of the day, a huge black cloud rose from the mountain, from which stones, ashes, and pumice were poured down on all the region around. The elder Pliny, who commanded the Roman fleet at Misenum, sailed to the help of the distracted inhabitants: he landed near the base of the mountain, was enveloped in sulphurous vapor, and was suffocated. The younger Pliny gives a graphic account of the eruption in two well-known letters to Tacitus No lava was ejected on this occasion, nor indeed in any eruption in historic times till 1066. In the eruption of 79, Pompeii (q.v.) was buried under 20 ft. of loose ashes, and remained unknown for more than 16 centuries. A torrent of mud spread over Herculaneum (q.v.), which, by additions from subsequent repeated eruptions, now forms a thickness of 80 or 100 ft. Since this first famous eruption, V. has been an active volcano, and has been frequently but irregularly in eruption, about 60 great and numerous smaller ones having taken place. In 472, the eruption was so great that the ashes fell even at Constantinople, and caused great alarm there. The summit known as Monte Nuovo was, 1538, forced up in two days to the height of 413 ft., with circumference of 8,000 ft. In 1631, the villages at the foot of the mountain were covered with lava, and torrents of boiling water were sent forth: 18,000 persons are said to have lost their lives at this time. Since the eruption described by Pliny, one of the most famous is that of 1779, of which Sir William Hamilton, then Brit. minister at Naples, gives an interesting account. In the spring of that year, V. began to pour forth lava; this was succeeded by rumbling noises and puffs of smoke; then jets of red-hot stones and ashes appeared, and increased in number and intensity, until the eruption arrived at its climax Aug. 5–10. Then enormous volumes of white clouds rose from the crater to a height four times that of the mountain, and lava poured from the crater in torrents down the sides of the cone. This was followed by columns of fire, which rose on some occasions to three times the height of V. or more than two m. In the midst of all this, showers of stones, scoriæ, and ashes were thrown to a great height. One mass of rock ejected was 108 ft. in circumference, and 17 ft. high. A more terrible eruption took place 15 years later, by which the greater part of the town of Torre del Greco was destroyed. The violent eruption of 1822 has been alluded to above. A remarkable eruption occurred 1855, May. In 1865 began a series of eruptions, which have been repeated at intervals since. For full account of the fearful outbreak of 1872, Apr., we are indebted to Palmieri, director of the Meteorological Observatory on Mount Contaroni, a part of V., who with great courage remained in the observatory while it seemed threatened with destruction. An eruption

equal in brilliancy to that of 1872, but much less destructive, took place 1878; another 1880.—A wire-rope railway to the top of V. was opened 1880, having two lines of rails, so that while one carriage goes up, the other comes down: it extends to within 450 ft. of the mouth of the crater.

VESZPREM, *vĕs'prĕm* (Ger. *Weiszbrunn*): town in w. Hungary, 65 m. s.w. of Budapest. It contains a handsome episcopal palace, a fine cathedral, a Piarist college, and a gymnasium. Cloth and flannel weaving, silk-spinning, cultivation of wine, fruits, and tobacco, are principal industries. The town has been on several occasions in the possession of the Turks; and an interesting memorial of them is a slender minaret, rising from an old Gothic tower, and which now serves as a watch-tower against fire. —Pop. (1886) 14,800.

VETCH, n. *vĕch* [F. *vesce;* OF. *veche, vesse*—from L. *vicĭa*, a vetch: It. *veccia*]: a leguminous plant with herbaceous stem, belonging to the genus *Vicia* (to which the *bean* also is referred) and sub-order *Papilionaceæ*, used for green fodder; the wild pea. VETCH'Y, a. *-ĭ*, consisting of vetches or of pea-straw; covered with vetches. VETCH'-LING, n. a little vetch (see LATHYRUS): see also FITCH.—*Vetches* have a tuft of hairs on the style beneath the stigma, nine stamens united, and one free; and mostly are climbing annuals, with pinnate leaves ending in tendrils, and with no terminal leaflet. The Common V. (*V. sativa*) sometimes called by agriculturists TARE, frequent in cultivated ground in Europe, and itself cultivated as green food for cattle, has rather large purple, blue, or red flowers in pairs, axillary and almost sessile. In cultivation, it varies considerably in size and other particulars, e.g., in breadth of the leaflets, number of them in a leaf, etc. Oats are generally sown with it, to afford it a little support, and thus prevent its rotting in wet weather. It is an immigrant in the United States, both the common form and a narrow-leaved variety, and two other European species, with long peduncles and small flowers, are found here, mostly near the Atlantic coast.—*V. Cracca* and *V. sepium* are very common Brit. species, the former with many-flowered stalks, bearing beautiful bluish-purple flowers, a beautiful climbing plant, and a chief ornament of trees, hedges, and bushy places in the latter part of summer. These and other species, natives of different parts of Europe and n. Asia, have been recommended for cultivation, and generally agree with the Common V. both in their qualities and in the mode of cultivation which they require: *V. biennis* and *V. Narbonnensis* are among those chiefly cultivated in parts of Europe. The species of *Vicia* are very numerous, chiefly in temperate parts of the n. hemisphere.—Our native species are perennials, with blue or purplish flowers, except one (*V. Caroliniana*) with whitish flowers, the keel tipped with blue. For Bitter V., see OROBUS.

VETERAN, a. *vĕt'ĕr-ăn* [F. *vétéran*, a veteran—from L. *vetĕrānus*, old, experienced—from *vetus*, aged, old: It. *veterano*]: grown old in service; experienced; long exercised, particularly in military life: N. one long exercised in any service, particularly that of war. VETERAN CORPS, old soldiers enrolled as milit. reserves for garrison-service, etc., in an emergency.

VETERINARY, a. *vĕt'ĕr-ĭ-nā-rĭ* [F. *vétérinaire*, veterinary—from mid. L. *vetĕrinārĭus*, a cattle-doctor—from L. *vetĕrīnæ*, draught cattle or beasts of burden—probably from *veho*, I carry: It. *veterinario*, veterinary]: pertaining to domestic animals and their medical and surgical treatment. VET'ERINA'RIAN, n. *-nā'rĭ-ăn*, a surgeon who treats the diseases of domestic animals, generally called a VETERINARY SURGEON.

VET'ERINARY MEDICINE: medical management and treatment of domestic animals. V. M. appears to have been studied by the ancient Egyptians, as well as by the Greeks and Romans. Hippocrates contributed a treatise on equine disorders; Columella and Vegetius (the latter about A.D. 300) left several curious veterinary works. Until after the middle of the 18th c. there were no schools for teaching V. M. The works pub. in France, Italy, etc., were of little value. In Britain, Blundeville and Gervase Markam, in the reign of Elizabeth, published vols. on farriery; Snape, farrier to Charles II., produced an anatomical treatise on the horse; Gibson, previously surgeon in a cav. regt., about the middle of the 18th c. published *The Farrier's Guide*, for many years the best authority on the subject. The treatment of sick horses remained, however, in the hands of the riding-master, the groom, or the shoeing-smith or farrier; while the treatment of the other domestic animals devolved on the goat-herd, shepherd, or cow-leech.

V. M. as a scientific art takes date from 1761, when the first veterinary college was established at Lyons, France, with royal patronage, under Bourgelât. Five years later, the flourishing school of Alfort, near Paris, was founded. 1791, Feb., the London College was organized. In Scotland, Dick, 1823, began systematic teaching of V. M.; he erected college buildings in Edinburgh, with hospital for sick animals collected a valuable museum, and engaged efficient assistants to instruct his pupils in anatomy and physiology, chemistry and materia medica, cattle-practice and histology. At his death Dick bequeathed to the city of Edinburgh his college and his entire fortune, to be devoted to the teaching and improvement of veterinary medicine.

In 1844, a royal charter was granted, under which veterinary surgeons (graduates of either the London or Edinburgh College) became a corporate body, entitled 'The Royal College of Veterinary Surgeons': this college has authority to appoint examining boards, to grant diplomas or licenses to practice, and to grant the higher title of fellow to eminent members of the profession. By the act of 1881 this college provides for examination of students from Brit. veterinary colleges, and for conferring diplomas on

those qualified. In many English towns and districts there are veterinary practices worth £600 to £1,000 a year; while a few exceed that amount.

In the United States the number of educated practitioners is rapidly increasing. The first charter for a college of instruction in V. M. in the United States was secured in Penn. 1853, but no organization was effected. The first establishment of the kind to go into operation was the New York College of Veterinary Surgeons, chartered 1857. The American Veterinary College is an offshoot from this institution. Some of the agricultural colleges have professorships of V. M.; and investigations in this line are carried on by many of the govt. experiment stations—special attention being given to hog-cholera, Texas fever, tuberculosis, and kindred diseases.

Among leading writers on V. M. are: Armatage, *Every Man His Own Cattle Doctor*, also, *Every Man His Own Horse Doctor;* Ashmont, *Dogs: Their Management and Treatment in Disease;* Fleming, *Animal Plagues;* Gamgee, *Domestic Animals in Health and Disease;* Gresswell, *Diseases and Disorders of the Ox*, also, *Manual on the Theory and Practice of Equine Medicine;* Law, *Farmer's Veterinary Adviser;* Liautard, *On the Lameness of the Horse;* Robertson, *The Practice of Equine Medicine;* Tellor, *Diseases of Live Stock;* Williams, *Principles and Practice of Veterinary Medicine*, also, *Principles and Practice of Veterinary Surgery.* Many of the standard works on the various classes of live-stock incidentally treat of the diseases of animals, and numerous agricultural and live-stock journals have special departments for this subject.

VETHAKE, *věth'ak*, Henry, ll.d.: educator: 1792–1866, Dec. 17; b. Demerara. Coming to the United States with his parents, he entered Columbia Coll., New York, graduated 1808, and studied law. He became teacher of mathematics in Columbia 1813, and the same year prof. of mathematics and nat. philos. in Rutgers (then Queen's) Coll.; held a like chair at Princeton 1817–21, at Dickinson Coll. 1821–29, and in the Univ. of the City of New York 1832–35. He then was for a year pres. of Washington Coll., Lexington, Va. He was prof. of mathematics 1836–55, and 1855–59 prof. of intellectual and moral philosophy, in the Univ. of Penn.; and was chosen vice-provost 1846, provost 1854. From 1859 till his death he was prof. of the higher mathematics in the Philadelphia Polytechnic Coll. He pub. *Principles of Polit. Econ.*, and edited McCulloch's *Dic. of Commerce.*

VETIVER, *vět'ĭ-vĕr*, or Cus'cus: dried roots of an E. Indian grass (*Andropogon muricatus*) which has a very agreeable and persistent odor, something like sandalwood; used to perfume linen, etc. Baskets, fans, and mats are made of it in India; it yields its perfume for many years, and it is strongest when moistened.

VETO, n. *vē'tō*, VE'TOES, n. plu. *-tōz* [L. *vĕto*, I forbid]: the right possessed by the executive power of a state, as by a king, a president, or a governor, to negative the laws or propositions passed or promoted by the legislative assemblies of the state; a similar right possessed by one legislative assembly over another: any authoritative prohibition: V. to forbid or disallow; to withhold assent to, as to a law. VE'TOING, imp. VETOED, pp. *-tōd*. VE'TOIST, n. *-tō-ĭst*, one who exercises a veto; one who maintains the right of veto. VETO ACT, in Scottish Ecclesiastical Law: see PATRONAGE: SCOTLAND, CHURCH OF.—The *Veto* in the United States denotes the power given by the constitution to the pres. to negative any act of congress by refusing to sign the bill as passed: he returns the bill to the house which first enacted it, and states his objections. The house may then reconsider the bill; and if the bill passes both houses by a two-thirds majority, it becomes law notwithstanding the president's veto. Under the constitution of the several states, a similar power is vested in the governors of states; though in some states a mere majority in both houses suffices to pass the bill over the governor's veto. The U. S. constitution further provides thus: 'If any bill shall not be returned by the pres. within ten days (Sunday excepted) after it shall have been presented to him, the same shall be a law in like manner as if he had signed it, unless the congress by their adjournment prevent its return, in which case it shall not be a law.' The power thus resting with the pres. to prevent the enactment of a law sent to him from the congress within the ten days previous to its adjournment—and to prevent the enactment without notifying the congress of his refusal to sign it or of his objections to it—is familiarly known as the 'pocket-veto.'

In the United Kingdom, the crown cannot alter existing law, but may refuse to sanction alterations consented to by the two houses of parliament. The necessity for such refusal is usually obviated by observance of the constitutional principle that the will of the sovereign is that of the responsible ministers of the crown, who continue in office only so long as they have the confidence of parliament. The royal veto is reserved for extreme emergencies; the last instance in which it was exercised was in 1707, by Queen Anne. The house of lords will generally support the prerogative of the crown by rejecting a measure repugnant to the sovereign; and a knowledge of this may enable the ministry to defeat it in the house of commons—thus avoiding a collision between the branches of the legislature. In bills of supply, the power of the house of lords amounts merely to a veto, as does that of the house of commons in bills affecting the peerage.—For the Polish *liberum veto*, see POLAND.

Experience has abundantly shown (e.g., in France 1791–95) that the power of veto in some form is essential to give stability to the government, and moderation to faction.

VETTURA, n. *vĕt-tū'rā* [It. *vettura*—from L. *vectūra*, a carrying or conveying—from *veho*, I bear or carry]: in *Italy*, a 4-wheeled travelling carriage. VETTURINO, n. *vĕt tū-rē'nō*, or VET'TURI NI, n. plu. *-nē*, in *Italy*, a hackney-coachman; one who lends coaches on hire, a traveller's guide.

VEUILLOT, *vĕh-yo'*, LOUIS: French journalist and author; 1813, Oct. 11—1883, Apr. 7; b. at Boynes en Gatinais (Loiret). He became a journalist, and his personalities involved him in duels. He visited Rome 1838, previous to which, he states, he was without much faith, religious or political. He returned to Paris a zealous adherent of the papacy; and, as editor of the *Univers*, soon signalized himself as an uncompromising champion of the church. In his renewed editorship of the *Univers* 1848, his polemical disquisitions called forth the censure of the abp. of Paris, and in 1853 of the bp. of Orleans; and the *Univers* was suppressed by govt. 1861. Later, it was replaced by the *Monde*, in which V. discussed religious matters in a more temperate spirit. Ultimately V. became an enemy of all progress, and a furious legitimist.

VEVAY, *vĕh-vā'* (Ger. *Vivis*): small town of Switzerland, canton of Vaud; remarkable for beauty of situation; on the n. shore of the Lake of Geneva, 11 m. e. of Lausanne. It stands at the mouth of the gorge of the Veveyse, where it opens on the lake. From the near elevations, the fine view to the e. commands the gorge of the Rhone, backed by the magnificent rampart of the Alps of Valais. In the Church of St. Martin (date 1438), Ludlow, one of Charles I.'s judges, and Broughton, who read to him his sentence of death, are buried. In the vicinity are many vineyards and orchards.—Pop. (1880) 7,820; (1888) 8,144.

VEX, v. *vĕks* [F. *vexer*, to vex—from L. *vexārĕ*, to harass, an intensive form of *vehĕrĕ*, to carry: It. *vessare*]: to irritate by petty provocations or annoyances; to harass; to disquiet; to distress; to fret; to toss to and fro; in *OE.*, to be uneasy. VEX'ING, imp. VEXED, pp. *vĕkst:* ADJ. debated; disputed, as a *vexed* question. VEX'ER, n. *-ĕr*, one who vexes. VEX'INGLY, ad. *-lĭ*. VEXATION, n. *vĕks-ā'shŭn* [F.—L.]: the act of disquieting or harassing; state of being disturbed in mind; great uneasiness; teasing or great troubles; the cause of trouble. VEXA'TIOUS, a. *-shŭs*, causing annoyance; teasing; full of trouble. VEXA'TIOUSLY, ad. *-lĭ*. VEXA'TIOUSNESS, n. *-nĕs*, quality of giving trouble and disquiet.—SYN. of 'vex': to tease; irritate; provoke; trouble; afflict; offend; displease; mortify;—of 'vexation': chagrin; agitation; mortification; trouble; grief; sorrow; distress.

VEXIL, n. *vĕks'ĭl*, or VEXILLUM, n. *vĕks-ĭl'lŭm* [L. *vexillum*, a military ensign or standard—dim. of *vēlum*, a veil]: in *bot.*, the upper or posterior petal of a papilionaceous or pea flower. VEX'ILLARY, a. *-lĕr-ĭ*, in *bot.*, applied to a form of æstivation in which the vexillum or upper petal is folded over the other; also VEX'ILLAR, a. *-ĭl-lĕr*. VEXIL'LARY, n. a standard-bearer.

VIA, n. *vī'ă* [L. *via*, a way]: a way; a highway; often used adverbially in the ablative case (*viâ*) meaning by way of, as *viâ* Buffalo. VIA MEDIA, *-mē'dĭ-ă*, a middle course.

VIABLE, a. *vī'ă-bl* [F. *viable*, viable—from *vie;* L. *vīta*, life—from *vivo*, I live]: capable of living; likely to live, as a new-born child. VI'ABIL'ITY, n. *-bĭl'ĭ-tĭ* [F. *viabilité*—from L.]: capacity of living after birth; capability of living.

VIADUCT, n. *vī'ă-dŭkt* [L. *via*, a way; *ductus*, pp. of *ducĕrĕ*, to lead]: structure, usually open and arched on piers, a sort of extended bridge, for carrying a road or railway over a valley or deep depression; distinguished from an *Aqueduct* (q.v.) for conveyance of water over a hollow or valley: see BRIDGE: TUBULAR BRIDGE, etc.

VIAL, n. *vī'ăl* [see PHIAL]: a small glass bottle. VI'ALLED, a. *-ăld*, contained in a vial or vials: see also *note* under PHIAL.

VIA-LACTEA, n. *vī'â-lăk'tē-â:* in *astron.*, the galaxy or milky way: see GALAXY.

VIA-MALA, *vē'â-mâ'lâ:* remarkable defile or crevasse in the canton of Grisons, Switzerland; a portion of the Hinterrheinthal (see RHINE) between Thusis and Zillis. The sides of the cleft, which is about two m. in length, are immense walls of rock, almost parallel, and so hard that the disintegrating influence of the elements appears to have little effect on them, each projection on one side corresponding to an indentation on the other, almost as perfectly as at the time they were separated. The walls have a maximum height of about 1,600 ft., and at various parts of the defile are not more than 30 ft. apart at the top. Far beneath, the Hither Rhine, compressed till it appears to one above like a mere thread, rushes like an arrow through the gorge. The first part of this defile was long deemed inaccessible, and had received the name of the Lost Gulf (F. *Trou perdu;* Ger. *Verlorenes Loch*); but in the early part of the 19th c. a magnificent road was constructed through the V.-M., 400 to 600 ft. above the river, by blasting and cutting a 'notch' in the side of the rock. The road is necessarily steep and narrow, crosses from side to side by three bridges, and is protected from falling stones and trees by a canopy of rock overhead here, and by a wooden roofing there. So narrow is the crevasse in some places, that fallen trunks and stones are sometimes wedged in between its sides above the ordinary water-level; and on the occasion of the great flood of 1834, the river, generally 400 ft. below the second bridge, rose to within a few ft. of it, and carried off the upper bridge.

VIAMETER, n. *vī-ăm'ĕ-tĕr* [L. *via*, a way; Gr. *metron*, a measure]: an Odometer (q.v.).

VIANDS, n. plu. *vī'ăndz* [F. *viande*, fresh meat—from mid. L. *vivanda* for *vivenda*, things needful for life, victuals—from L. *vivo*, I live]: provisions for eating; victuals; dressed meat; food: seldom used in the singular.

VIANNA, *vē-ân'nâ:* fortified city and seaport of n. Portugal; prov. of Minho; at the mouth of the Lima, 40 m. n. of Oporto. It is handsome and clean, with a fairly good harbor, which admits vessels of 150 tons; and it has considerable trade with Newfoundland in salt-fish.—Pop. 8,816.

VIAREGGIO, *vē-â-rĕd'jō:* town of central Italy, prov. of Lucca; close to the shore of the Mediterranean, 30 m. s.e. of Spezia, 13 m. by rail n.n.w. of Pisa. It is modern, stands in a delightful plain, and has wide straight streets. At the beginning of the 19th c. it consisted of only a few huts; but its climate, which is healthful and delightful all the year, and its fine situation, have invited many residents, and it is yearly increasing in extent and population. It is a favorite sea-bathing resort in summer.—Pop. (1881) 10,190.

VIATICUM, n. *vī-ăt'ĭ-kŭm* [mid. L. *viatĭcum*, a road, a street, in classical L., provision for a journey—from L. *via*, a way: It. *viatico;* F. *viatique*, the sacrament administered to a dying person]: in the *Rom. Cath. Chh.*, the Eucharist administered to a dying person. VIAT'IC, a. of or concerning a journey.—The *Viaticum* is very ancient (see LORD'S SUPPER); it was the one exceptional case in which, during the times of rigorous canonical penance, penitents were admitted to the communion before the completion of the appointed cycle of penance. By the modern practice of the Roman Church, it is permitted to the sick to receive it though they may not have fasted (as is required in all other cases) from the previous midnight. The viaticum may be given frequently during the same sickness, at intervals, even daily, should it be earnestly desired by the sick person. The priest is ordered to bring the sacred elements from the church to the dying person at any hour, whether by day or by night, when he may be called on for this last service of religion.—Protestants mostly reject the idea of the V. as superstitious, or use it only in special cases with cautious explanations: some, however, verge toward the Rom. Cath. view.

VIATKA: see VYATKA.

VIAZMA: see VYAZMA.

VIBICES, n. plu. *vĭb-ī'sēz* [L. *vibex*, the mark of a blow or stripe, *vibīces*, plu.]: patches on the skin, varying in tint from bright red to violet, which occur in certain diseased conditions of the blood, especially in purpura. They are caused by minute hemorrhages of the capillaries of the true skin: known also as *ecchymosis;* called *petechiæ* when very small.

VIBORG, or WIBORG, *vē'borg:* oldest city in N. Jutland, and one of the oldest in Denmark; cap. of the prov. of V.; at the head of the Bay of V., in the Gulf of Finland; at the mouth of the Saima canal (37 m. long), connecting the sea with Lake Saima, about 250 ft. above sea-level, and with a long series of navigable lakes northward. The castle (1293) was a centre for establishing Christianity in Karelia, and a stronghold of Swedish power. Its ca-

thedral, founded 12th c., was rebuilt 1726. V., at which all the great highways of the interior converge, is important as a military post. The people are engaged in manufacture of woolen fabrics, leather, and tobacco.—Pop. (1884) 15,800.

VIBRACULA, n. *vĭb-răk'ū-lă* [L. *vibro*, I shake]: long filamentous appendages found in many *Polyzōă*.

VIBRANT, a. *vī'brănt* [L. *vibrans* or *vibran'tem*, quivering; *vibrārĕ*, to quiver]: vibrating; trembling.

VIBRATE, v. *vī'brāt* [L. *vibrātus*, pp. of *vibrārĕ*, to set in tremulous motion: F. *vibrer*]: to move to and fro; to quiver; to oscillate; to cause to quiver; to sound tremulously; to tremble; to waver. VI'BRATING, imp. VI'BRATED, pp. VIBRATION, n. *vī-brā'shŭn* [F.—L.]: a tremulous motion; the act of moving or state of being moved one way and the other in quick succession; the tremulous motion produced in a body when struck, or disturbed by any impulse. VIBRATILE, a. *vī'brā-tĭl*, adapted to or used in vibratory motion. VI'BRATIL'ITY, n. *-tĭl'ĭ-tĭ*, the quality of being vibratile or vibratory. VI'BRATORY, a. *-tĕr-ĭ*, vibrating; that shakes; that moves to and fro in quick succession; consisting in vibrations; also VI'BRATIVE, a. *-tĭv*. VIBRATILE ORGANS, hair-like organs of motion—termed also *cilia*. VIBRIO, n. *vī'brĭ-ō*, a name given to very minute thread-like animalcules.

VIBRIONIDÆ, *vī-brĭ-ŏn'ĭ-dē:* family of microscopic organisms, named from their darting and quivering motion. They are allied to the Bacteria (q.v.), from which they differ in being jointed. It has been debated whether they are animal or vegetable, but they are now classed with plants. See GENERATION, SPONTANEOUS: GERM-THEORY.

VIBRISSA, n. *vī-brĭs'sâ*, or VIBRIS'SÆ, n. plu. *-sē* [L. *vibrissæ*, hairs in the nose of man—from *vibro*, I shake]: one of the hairs found growing at the entrance of the nostrils, and other outlets; in the plural, the whiskers in cats.

VIBURNUM, *vī-bĕr'nŭm:* genus of plants of nat. order *Caprifoliaceæ*, having a 5-toothed calyx, a 5-lobed, wheel-shaped, bell-shaped, or tubular corolla, 5 stamens, 3 sessile stigmas, and a one-seeded berry. The species are shrubs with simple leaves, and are numerous in the United States; including the Sweet V. or Sheepberry, the Black Haw, the Arrow-wood, the Maple-leaved Arrow-wood, the Cranberry-tree, the Hobble-bush or American Wayfaring-tree, and other species. They are in general natives chiefly of n. parts of the world. *V. opulus* is the Guelder Rose (q.v.), or Snowball-tree, and *V. Laurustinus* the Laurustinus (q.v.), both common ornamental shrubs. *V. Lantana*, sometimes called the WAYFARING-TREE, is a native of warmer temperate parts of Europe and Asia, and is often planted as an ornamental shrub. It is a large shrub or low tree, with large elliptic serrated leaves, downy, with star-like hairs on the underside: the young shoots are very downy. The flowers are small and white, in large

dense cymes; the berries purplish black, mealy, and mucilaginous, with peculiar sweetish taste, disagreeable to many, but relished by some: they are useful in diarrhea and catarrh. Bird-lime is made from the roots in s. Europe. The inner bark is very acrid, and was formerly used as a vesicant. The wood is prized by turners. Tubes for tobacco-pipes are made of the young shoots.

VICAR, n. *vĭk'ĕr* [F. *vicaire*, a vicar—from L. *vicārĭus*, that supplies the place of another, a substitute—from *vicis*, change, interchange: It. *vicario*]: one who performs the function of another; in the *Chh. of Eng.*, the incumbent of a benefice who receives only the smaller tithes or a salary. VIC'ARAGE, n. *-āj*, the benefice or residence of a vicar. VIC'ARSHIP, n. the office of vicar. VICARIAL, a. *vī-kā'rĭ-ăl*, pert. to a vicar; vicarious. VICA'RIATE, a. *-āt*, having delegated power: N. a delegated office or power. VICA'RIOUS, a. *-ŭs*, acting in place of another; substituted in place of another. VICA'RIOUSLY, ad. VICAR-APOSTOLIC, in the *Rom. Cath. Chh.*, a missionary priest or bishop having powers direct from the pope. VICAR-GENERAL, in the *Eng. Chh.*, an assistant of a bp or abp., having full authority over the diocese. VICAR OF JESUS CHRIST, the pope, as assumed to represent Jesus Christ on the earth.—A *Vicar* is the substitute, temporary or permanent, appointed to act in place of certain ecclesiastical officials, whether individuals or corporations—e.g., in place of the pope, a bishop, a chapter, a parish priest, etc. Vicars of the pope are called 'vicars-apostolic,' and are generally invested with episcopal authority in some place where there is no canonical bishop. A V. of a bp. is either a 'V.-general,' having the full authority of the bp. over all his diocese, or 'V.-forane' [L. *foraneus*, from *foris*, abroad], whose authority is confined to a particular district, and generally otherwise limited. A 'V.-capitular' is the person elected by the chapter of a diocese, during the vacancy of the see, to perform all the functions of a bishop, except that he is not competent to do any act of episcopal order, as ordination, confirmation, etc., and his power is restricted in some other ways. A parochial V. is either perpetual, as in parishes anciently held *In Commendam* (q.v.), or held by religious corporations; or temporary, whose appointment may be recalled at pleasure, or after a fixed time. The name, in this sense, is sometimes given, especially in the Rom. Cath. Church, to the assistant priest, or, as he is called in England, the curate, in a parish. For the functions of 'vicars-apostolic,' see IN PARTIBUS.

VICE, pref. *vīs* [F. *vice*—from L. *vĭcĕ*, instead of, in place of; *vicis*, change: It. *vice*]: denoting one who acts in place of another; denoting one who is second in authority, but holding the same title, as *vice-admiral* (see ADMIRAL), *vice-chamberlain* (see CHAMBERLAIN), *vice-chancellor*, *vice-president*, etc. VICE, prep. *vī'sē*, used as a separate word before a proper name, and means 'in the place of,' as B *vice* C resigned—that is, B in the place of C, who has resigned. VICE VERSA, ad. *vī'sē vĕr'sâ* [L. *versâ*, being turned]: the reverse; the terms being interchanged.

VICE, n. *vīs* [F. *vice;* Sp. *vicio;* It. *vizio*, vice—from L. *vĭtĭum*, a fault]: a blemish; an imperfection; fault; depravity or corruption of morals; the opposite of *virtue;* unlawful or immoderate indulgence which has become habitual; a fault or bad trick in horses; a defect; the fool of the old shows and moralities. VICIOUS, a. *vĭsh'ŭs* [F. *vicieux*, vicious—from L. *vĭtĭōsus*]: having a vice or defect; depraved; spiteful; malicious; wicked; corrupt; having an ill temper, as a horse. VI'CIOUSLY, ad. *-lĭ*. VICIOUSNESS, n. *-nĕs*, the state of being vicious; also VICIOSITY, n. *vĭsh'ĭ-ŏs'ĭ-tē*. VICED, a. *vīst*, in *OE.*, vicious; corrupt.—SYN. of 'vice': crime; sin; iniquity; fault, guilt; offense; misdeed; wrong; wickedness; injustice; injury.

VICE, SOCIETIES FOR SUPPRESSION OF: voluntary organizations aiming to suppress different forms of vice, and particularly gambling and the circulation of obscene books, pictures, etc. The first important society founded for this end was incorporated in New York 1873, May 6; but it dates its origin from 1866, when the Young Men's Christian Assoc. of that city began a systematic investigation of the trade in obscene literature, paintings, and prints. The Y. M C. Assoc. carried on the crusade through a special committee of its members till 1873, when the soc. was incorporated. For a year before incorporation, Anthony Comstock was the principal agent of the assoc. in this work; since incorporation he has been the chief executive officer of the New York Soc. for Suppression of Vice. The donations to the soc., 1872, Mar.—1874, Jan. 28, amounted to $7,508; in the same time the agents of the society seized 130 000 lbs of bound books, 194,000 pictures, 4,750 newspapers, 20,000 letter orders, 130,275 circulars, and much other material; 106 offenders were arrested. The report of the society's work 1890, Jan., shows that to that date the arrests numbered 1,480; the fines imposed $100,000; lottery tickets seized 1,799,640; pool tickets 1,522,294; 41½ tons of obscene matter and 12½ tons of gambling material destroyed. Societies of like nature exist in the New England states, the central west, and the Pacific states; and there are local or branch societies in many cities. In some foreign countries, also, there are similar societies, e.g., London, Paris, Bombay.

VICE, n., or VISE, *vīs* [F. *vis*, a screw, a winding stair—from L *vitis*, a vine—so named from a comparison to the tendril of a vine: It. *vite*, a vine, a screw]: a small iron or wooden press tightened by a screw, used for holding fast an object on which a person is at work, as in the process of filing, etc. (see VISE): in *OE.*, grip: grasp: V. in *OE.*, to draw by violence; to force or compress, as if by a vice.

VICE-ADMIRAL, n *vīs-ăd'mĭ-răl* [*vice* 1, and *admiral*]: a superior officer of the navy next below an admiral (see ADMIRAL: FLAG-OFFICER). VICE-ADMIRALTY, n. the office of a vice-admiral.

VICE-CHAMBERLAIN, n. *vīs-chām'bĕr-lān* [*vice* 1, and *chamberlain*]: officer of the Brit. royal household immediately under the Lord Chamberlain (q.v.).

VICE-CHANCELLOR, n. *vīs-chăn'sĕl-ĕr* [*vice* 1, and *chancellor*]: deputy or substitute of a chancellor; deputy or lower judge of a court of chancery or equity (see CHANCELLOR: CHANCERY, COURT OF); officer of a university who is empowered to discharge the duties of the chancellor.

VICE-CONSUL, n. *vīs-kŏn'sŭl* [*vice* 1, and *consul*]: a subordinate officer to whom consular functions are delegated in some particular part of a dist. already under the supervision of a Consul (q.v.).

VICEGERENT, n. *vīs-jē'rĕnt* [L. *vĭcĕ*, instead of, and *gerens* or *geren'tem*, carrying; *gerĕrĕ*, to carry]: one who is deputed to exercise the powers of another. ADJ. having or exercising delegated power. VICEGE'RENCY, n. *-rĕn-sĭ*, office of a vicegerent; deputed power.

VICENNIAL, a. *vī-sĕn'nĭ-ăl* [L. *vīcēni*, twenty; *annus*, a year]: existing or continuing twenty years. VICENNIAL PRESCRIPTION, in the law of Scotland, the limitation which is put to certain actions after the lapse of 20 years.

VICENTE, GIL, *zhēl vē-sĕn'tā:* father of the Portuguese drama: b. latter part of the 15th c., whether at Guimaraes, Barcellos, or Lisbon, is disputed; d. 1557. He studied jurisprudence at the Univ. of Lisbon; but his tastes soon drew him to poetry. His first poetical essay, a pastoral in Spanish, was favorably received at the court of Emanuel the Great: it was represented 1502, to celebrate the birth of the prince who became John III. He produced in all 42 pieces, of which 10 were in Spanish, 15 partly or chiefly so, and 17 in Portuguese. His fame spread beyond his own country, and Erasmus is said to have mastered Portuguese for the purpose of reading his works. At home, however, he had detractors, whom he sought to silence once at a party by composing impromptu, on a given proverb, the farce *Inez Pereira*, his best piece. Complaints in his works indicate that the court was not liberal enough to keep him from want in his later years. He has been called the Plautus of Portugal, and has historical importance as the founder of a national theatre in his country. In 1834 a complete reprint of his works was undertaken by Barreto Feio and Monteiro (3 vols. Hamb.).

VICENZA, *vē-chĕn'dzâ:* city of Italy, cap. of prov. of V.; at the confluence of the rivers Bacchiglione and Retrone, 42 m. w. of Venice by railway. The rivers are crossed by eight bridges, one of which, a bold single arch, is said to be the work of Palladio (q.v.), a native of the city, to whose genius it is much indebted for its beauty. V. is surrounded by a moat, and walls half in ruins, is about 3 m. in circumference, is entered by 6 gates, and contains many fine palaces and churches. In the Piazza dei Signori, a remarkably fine square, is a lofty and slender campanile, 270 ft. high, and only 23 ft. wide. The Palazzo della Ragione is a handsome Gothic building, by Palladio. The Palazzo Prefettizio, by the same architect, is a rich and fanciful Corinthian edifice. The Duomo, built 1467, is Gothic: the nave is 60 ft. wide: and in certain of its chapels are noteworthy pictures. The Teatro Olimpico, whose

scenery is fixed and represents a kind of piazza, with diverging streets of real elevation, but diminishing in size, is by Palladio. V. is the seat of a bishop; and contains a lyceum, a seminary, and a picture-gallery, a library of 60,000 vols., a hospital, and many other benevolent institutions. Manufactures of silk, linen, earthenware, paper, and velvet are carried on. The surrounding country, studded with mansion-houses, and rich in vineyards, is exceedingly beautiful.

V. (anc. *Vicentia*, or, perhaps more correctly, *Vicetia*) is a very ancient city. An inscription records its existence B.C. 136; and it continued to be a municipal town of some importance till it was laid waste by Attila, A.D. 452. It revived under the Lombards, and became for a time, in the middle ages, an independent republic.—Pop. (1881) 24,334; with suburbs 27,694; (1901) 44,777.

VICE-PRESIDENT, n. *vīs-prĕz'ĭ-dĕnt* [*vice* 1, and *president*]: a person appointed beforehand to take the place of a president in certain contingencies; or, as in banks, railway and other corporations, to assist the president as do the heads of certain departments.—The *V.-P. of the United States* is, like the president, elected for four years. He presides in the senate, but, not being a senator, has no vote other than a casting-vote when the senate is equally divided. In case of the removal, death, resignation, or inability of the pres., the V.-P. becomes pres.—his place in the senate being filled by a pres. of the senate *pro tem.*, elected by the senate itself. Should both the pres. and the V.-P. resign, die, or be removed, then, by chap. 4, acts of the XLIXth congress, the succession to the presidency devolves on the following officials, in the order named: the sec. of state; the sec. of the treasury; the sec. of war; the attorney-general; the postmaster-general; the sec. of the navy, and lastly the sec. of the interior.

VICEREGAL, a. *vīs-rē'găl* [*vice* 1, and *regal*]: pertaining to a viceroy.

VICEROY, n. *vīs'roy* [F. *vice-roi*, a viceroy—from L. *vĭcĕ*, instead of, and F. *roi*; L. *rex*, a king]: governor of a country or province ruling in the name and by the authority of the king; officer delegated by a sovereign to exercise regal authority in his name in a dependency; e.g., the lord-lieut. of Ireland—who, however, is never officially so styled; the governor-general (or *Viceroy*) of India; the Khedive (q.v.) (or *Viceroy*) of Egypt. V. was the proper official designation of the governors of Naples, Spain, and Peru, under the old Spanish monarchy. VICEROYALTY, n. *vīs-roy'ăl-tĭ*, office, dignity, or jurisdiction of viceroy; also VICE'ROYSHIP, n.

VICE-VERSA: see under VICE 1.

VICH, *vĕk*, or VIQUE, *vĕk*: city of Spain, in Catalonia, modern prov. of Gerona; on a hill-girt plain about 38 m. n. of Barcelona. Its cathedral, built about 1040, repaired and modernized about the end of the 18th c., is bold and elegant in the interior; and the Gothic cloisters are exceedingly rich and elegant. Corn, fruit, and a poor wine

are the products of the vicinity; and the inhabitants are employed in weaving, and in manufacture of hats and paper. V., the Roman *Ausa*, was afterward called *Ausona* and *Vicus Ausonensis*, of the first part of which its present name is a corruption.—Pop. (1901) 13,000.

VICHY, *vē-shē'*: small town of the interior of France, dept. of Allier; on the Allier, in a fine valley, surrounded by hills clad with vines and fruit-trees; 35 m. s.s.e. of Moulins, 227 m. by rail s.s.e. from Paris. V. is the most fashionable bathing resort in France. The springs which rise at the foot of the volcanic mountains of Auvergne (q.v.) are the most efficacious alkaline springs known: they vary in temperature from 68° to 112° F., and are used for drinking and bathing, in cases of indigestion, chronic catarrh, gout, liver-disease, diabetes, and gravel: see MINERAL WATERS.

The virtues of the *aquæ calidæ* of this place were known in Roman times, as is testified by the numerous remains of marble baths and coins of the times of Claudius and Nero that have been dug up; but their modern repute arose only in the 19th c.—Pop. of town (1901) 11,000.

VI'CIA: genus of plants: see VETCH: BEAN.

VICINAGE, n. *vĭs'ĭ-nāj* [F. *voisinage*, neighborhood—from L. *vicīnus*, neighboring—from *vicus*, a village, allied to Gr. *oikos*, a house: It. *vicino*, near] · the place or places adjoining or near; neighborhood. VICINITY, n. *vĭ-sĭn'ĭ-tĭ* [L. *vicinĭtas*, neighborhood]: nearness in place; neighborhood.

VICIOUS: see under VICE 3.

VICISSITUDE, n. *vĭ-sĭs'sĭ-tūd* [F. *vicissitude*—from L. *vicissĭtūdo*, change, alternation—from *vicis*, change: It. *vicissitudine*]: regular change or succession of one thing to another; irregular change; mutation, as in human affairs. VICIS'SITU'DINARY, a. *-tū'dĭ-nĕr-ĭ*, or VICIS'SITU'DINOUS, a. *-dĭ-nŭs*, characterized by change or revolution; full of vicissitude.

VICKSBURG, *vĭks'bĕrg*: city, port of entry, and cap. of Warren co., Miss.; on the Mississippi river, and on the Louisville New Orleans and Texas, and the Queen and Crescent Route railroads; 45 m. w. of Jackson, midway between Memphis and New Orleans. It is a prosperous place—the first city in pop. and commercial importance in the state, and the second port in value of shipments on the Mississippi river between St. Louis and New Orleans. It stands on a group of high bluffs rising from the river. Besides a large general river-trade, promoted by a line of packets plying between St. Louis and New Orleans, and a fleet of boats in waters tributary to the river, V. receives and ships a vast quantity of cotton. Its exports are almost exclusively cotton-seed oil, oil-meal, and, oil-cake, of domestic manufacture. Other manufactures are saw-mill products, foundry and machine-shop products, sashes and doors, boots and shoes, and carriages and wagons. In the suburbs are a U. S. national cemetery containing the graves of 17,000 Union soldiers and sailors, and a valuable

stone quarry. In 1891 V. had 2 national banks (cap. $250,000), 3 state banks, and 1 loan and trust company, and 2 daily and 5 weekly newspapers.—Pop. (1880) 11,-814; (1890) 13,373; (1900) 14,834.

VICKS'BURG, SIEGE OF: investment of that town by the Army of the Tennessee under Gen. Ulysses S. Grant; resulting in the surrender of the place 1863, July 4. Early in the war the strategic importance of the place was recognized, and V. was strongly fortified by the Confederates. The U. S. govt. found its capture necessary for the control of the Mississippi river; and immediately after the battle of Corinth, Gen. Grant began the movement on V., and 1862, Dec. 29, was at Young's Point, on the Mississippi, 3 m. above the town, with 50,000 men, while Admiral Porter was ready to co-operate with a fleet of gun-boats. But circumstances delayed the actual siege till May 18, when, having defeated Gen. Joseph E. Johnston, whose headquarters were at Jackson, Miss., Gen. Grant, after repeated encounters, compelled Gen. Pemberton to retire within the fortifications of V., and the lines of investment were drawn and fortified. At that date the Confederate army under Johnston, in Grant's rear, numbered about 30,000 men, and Pemberton's force in V. was somewhat larger. Grant's army numbered 71,000. V. was defended on the river-front by 30 pieces of the heaviest artillery and 13 field-pieces. On the land side were batteries at intervals of 200 yds.; the parapets were 10 ft. high, 25 ft. thick, and the ditch 7 ft. deep. Grant had in position, June 30, 220 field-pieces and a battery of heavy naval guns. The right of the line of investment was held by Gen. Sherman; next was Gen. McPherson; then Gen. McClernand held the left; the extreme left was held by Gen. Lauman. Grant's headquarters were at the n.e. angle, where the corps of Sherman and McPherson touched: the line was 15 m. long. An assault was made by the besiegers after exploding a mine June 25, but it failed. Another mine was sprung July 1, but without effect. Pemberton's supplies were failing, and dispatches that were captured showed that Johnston meditated an attack on Grant's rear, thus to afford Pemberton an opportunity to escape from the besieged town. That scheme was foiled, as was also Pemberton's plan of escaping across the river in boats. July 3, Pemberton asked for an armistice to arrange terms of capitulation; but Gen. Grant would listen to no proposition short of unconditional surrender. The Confederate commander perforce accepted Gen. Grant's terms—surrender of the town, the army, and war material; the men to be released on parole not to take arms till exchanged. July 4, the Confederate army marched out and laid down their arms, then returned to the city, and Gen. Logan's division entered and took possession. 27,425 men and 2,166 officers were paroled; 790 men refused to give the parole and were held as prisoners of war.

VICO, *vē'ko*, GIAMBATTISTA (or GIOVANNI BATTISTA): jurist, philosopher, and critic: 1668, June 23—1744, Jan. 20; b. Naples; son of a bookseller. He was educated by the Jesuits, and afterward studied for the bar. Weak health prevented him from following his profession; and after nine years he obtained the chair of rhetoric in the Univ. of Naples. In 1735 he was appointed historiographer to the king of Naples. As he married early, and had a large family, his life was passed in poverty; and it was, moreover, embittered by family troubles, and by constant ill health. The great work which has made his name illustrious, the *Scienza Nuova*, appeared 1725; but it was completely recast in an ed. 1730, with the effect of making it more imposing as a system, at the expense of a great loss of clearness. A third ed., enlarged, was pub. shortly after the author's death. In the *Scienza Nuova*, V. brought together, and attempted to fuse into a system, opinions which he had previously advanced in separate treatises. The slowness of the work in gaining its proper place in European literature must be attributed largely to its obscure and enigmatical style. Much of the obscurity arises from an uncouth terminology, which the author often leaves unexplained, and (in the later and authoritative editions) from rigorous application of the deductive method to subjects which do not always admit of it. The *Scienza Nuova* was virtually unknown out of Italy 1822, when a German transl. of it appeared at Leipzig. It was, a few years later, translated into French (with some curtailment) by Michelet (*Principes de la Philosophie de l'Histoire, traduits de la 'Scienza Nuova' de G. B. Vico;* Paris 1827); and V. has since found his proper rank among the most profound, original, and ingenious of modern thinkers.

The *Scienza Nuova* (*De' Principj d'una Scienza Nuova d'interno alla Comune Natura della Nazioni*) may be described as a *Novum Organum* of politico-historical knowledge. Observing, amid the infinite variety of thoughts and actions, of language and manners, which the history of nations presents, a constant recurrence of the same characteristics, and, in the political changes which peoples the furthest removed from each other in time and place have passed through, an essential similarity of development, V. proposed to himself the task of distinguishing amid social phenomena the regular from the accidental; of finding out the laws which govern the formation, the growth, and the decay of all societies; in fine, of tracing the outlines of the universal, the ideal history of society—the idea of which he himself believed to have existed from eternity in the mind of God. In doing this, he attempted, by historical criticism on the widest basis, to illustrate the interdependence of all the sciences; to show that the progress of each is related to that of all, and the progress of all of them dependent on, while also acting powerfully on, the general condition of society. And while holding that the actual state of every society is the result of a free development of the human faculties, he attempted to give a historical

demonstration of the existence of a Divine Providence directing the career of nations, overruling the designs which men propose to themselves; operating, however, not by positive laws or arbitrary interferences, but by methods and expedients to which men freely resort—i.e., God's providential governance of nations is not by continued miracle, but, like His rule over nature, by natural laws. It has been said that the *Scienza Nuova* includes a system of social (as distinguished from natural) theology—a demonstration of God's government of the world, and of the laws in which that government consists. V., in these inquiries, accepted from Descartes the individual consciousness as one of the criteria of truth; but he employed another also—the collective consciousness, or the common sense of mankind—the accord of the race, as it may be gathered from history—in a word, authority.

It would be difficult to overrate the ingenuity and originality of many of the inquiries into which V. was led by the attempt to delineate the ideal history of society; and he has rarely failed to express views rational and probable compared with those accepted among his contemporaries. With admirable insight, he has not seldom hit on the conclusions to which increased social knowledge and more scientific conceptions have conducted inquirers in later generations. Thus, in clearing the ground for the foundation of his system, he was led to precisely those views about Homer and the authorship of the Homeric poems which are popularly associated with the name of Wolf; and to anticipate the general view of the credibility of early Roman history which was elaborated by Niebuhr. (See also COMTE, the germs of many of whose speculations are in V.) The beginnings of religion, the origin of poetry and language, the commencement of society (which he ascribes to the influence of a common religious belief and worship), the foundation of the privileges of the heroic or aristocratic class, are among the earlier subjects of his speculation. He proceeds to trace the origin of jurisprudence, and to show how its development has been dependent on social changes; and he afterward deduces from the history of ancient societies, and in some degree from the history of the governments which sprang out of the ruins of the Roman empire, the laws which govern the progress, the conservation, and the decay of nations. A monarchy, with an equality of civil and political rights as between subjects, was his ideal of good government for advanced societies.

V.'s theory as to the *law of cycles* in history—the movement being similar in different nations, and the path in successive periods also being similar through recurrence of the same forces—has been misunderstood as a positive denial of actual or possible advance. But he simply does not deal with the problem of the laws governing the advance of the race; and his historic cycles may easily be conceived of as following each a path *similar* throughout to that of each preceding, yet with one continuous upward

movement as with a slow spiral ascent. This law however he does not develop.

Though he ascribed to religion a paramount influence in forming and in conserving society, and though it was one of his principal objects to demonstrate the divine government of the world, V. did not escape the suspicion of having written in a spirit of hostility to religion. It was alleged that he had written so obscurely, as he often did, through the fear of incurring ecclesiastical censures. Some critics of another school charged him, with at least equal plausibility, of having striven, both in his particular doctrines and in his consecration of the principle of authority, to satisfy the Rom. Cath. Church. The cavils on either side are little deserving of attention; and it is pleasant to know that V., though not unconcerned about the accusations against him, felt in his later years consoled for the many trials and disappointments of his life, by the completion of a work whose greatness he knew better than any of his contemporaries. In 1818 the Marquis de Villa Rosa published a collection of the whole of V.'s works (2d ed. 1835). See Flint's *Vico* (1884).

VICTIM, n. *vĭk'tĭm* [F. *victime*—from L. *victĭma*, the beast for sacrifice: It. *vittima*]: a living being, sometimes human, but usually a beast, sacrificed to some deity; a person or thing killed, injured, or made to suffer in the pursuit of some object, or in consequence of disease, disaster, or the like; hence, one who is duped or swindled by another. VIC'TIMIZE, v. *-īz*, to sacrifice or destroy in pursuit of some object; to cheat; to deceive. VIC'TIMIZING, imp. VIC'TIMIZED, pp. *-īzd*.

VICTOR, n. *vĭk'tĕr* [L. *victor*, a conqueror—from *victus*, conquered; *vincĕrĕ*, to conquer: It. *vittore*]: one who wins or gains the advantage in a contest or struggle of any kind, especially in war; one who defeats an enemy in battle: ADJ. conquering; victorious. VICTORIOUS, a. *vĭk-tō'rĭ-ŭs* [L. *victorĭōsus*]: conquering; superior in contest; that produces victory; triumphant. VICTO'RIOUSLY, ad. *-lĭ*. VICTO'RIOUSNESS, n. *-nĕs*, state or quality of being victorious. VICTORY, n. *vĭk'tĕr-ĭ* [L. *victōrĭa*]: conquest; superiority over an enemy; success in any contest; a triumph. VICTORIA, n. *vĭk-tō'rĭ-ă*, a low four-wheeled carriage with a calash top, affording accommodation for two persons in addition to the box or driver's seat; in *astron.*, an asteroid discovered in London by Hind 1850: a genus of *Nymphæăcĕæ* or Water-lilies, comprising only one species, *V. regia* or 'royal water-lily' (see below). VICTORINE, n. *vĭk'tō-rēn*, a small tippet of fur worn by women. VIC'TORESS, n. *-tĕr-ĕs*, or VIC'TRIX [L.], n. *-trĭks*, or VIC'TRESS, n. *-trĭs*, a female victor. VICTORIA CROSS, decoration, accompanied by a pension, granted in the Brit. army and navy for acts of distinguished valor (see CROSS, VICTORIA).

VICTOR, *vēk-tor'*, CLAUDE PERRIN, Duke of Belluno, and Marshal of France: 1764, Dec. 7—1841, Mar. 3; b. La Marche, dept. of Vosges. At the age of 17 he enlisted as drummer in a regt. of artillery. He received his discharge after 10 years of service as a common soldier; but re-enlisted 1792, and having attracted the attention of Napoleon by his able conduct at the siege of Toulon 1793, was promoted to brig.gen. In the Italian campaigns of 1796–7 and 1799–1800, he commanded the vanguard, and rising to the opportunities which Napoleon's estimate of him gave, evinced great skill and extreme daring. At Marengo he maintained such an obstinate resistance for eight hours to the overwhelming numbers of the enemy, that the expected reinforcements had time to arrive, and to convert the imminent victory of the Austrians into their crushing defeat. Having risen to gen. of division, he commanded 1806 with distinction a *corps d'armée* in the Prussian and Russian campaigns; and though captured 1807 by Schill's partisans, he was exchanged (for Blücher) in time to win, on the bloody field of Friedland, the baton of a marshal of the empire. As gov. of Prussia, he gained the esteem of the Prussians by his dignity and moderation; and 1808 he was created Duke of Belluno, sent to command the first *corps d'armée* in Spain. Here he gained several victories, notably over Blake at Espinosa, and Cuesta at Medellin; but was defeated by Wellington in the obstinate battle of Talavera (q.v.), and again by Sir Thomas Graham at Barrosa (q v.). After a fruitless blockade of Cadiz, he was recalled to command the ninth *corps d'armée* in the Russian campaign of 1812. When the allies, in overwhelming numbers, were closing round France, V. appeared prominently in the fore-front of the defense, made a valiant stand at the passes of the Vosges, and retook Saint Dizier and Brienne at the point of the bayonet; but his arriving too late (1814, Feb.) to occupy the bridge of Montereau was a fault which Napoleon could not pass over, and after a scene of violent recrimination V. was deposed in favor of Gérard (q.v.). Notwithstanding this disgrace, he continued with the army, and proved his zeal at the battle of Craonne. A severe wound which he there received brought his military career to a close; and in disgust at Napoleon's treatment he transferred his allegiance to the Bourbon dynasty, and became a violent accuser of his former master. V.'s servile loyalty to Louis XVIII. gained him a peerage and other honors; but his zeal as president of the military commission appointed to try those of his old companions in arms who had deserted to Napoleon during the 'Hundred Days,' brought upon him merited obloquy. He was minister of war 1821–23; second in command in the Peninsula 1823; and afterward appointed ambassador to the court of Vienna, which refused to receive him unless he laid aside his ducal title. After the revolution of 1830 he retired from public life. He died at Paris.

VICTOR-AMADEUS, *vĭk'tor âm-a-dē'ŭs*, I., Duke of Savoy: (ruled 1630–37): d. 1637; son and successor of Charles-Emmanuel the Great. He carried on the inherited war with France; but 1631 he was forced to surrender Pignerol, La Perouse, Angrone, and Luzerne to France, in exchange for Montferrat and Alba. He gave attention to the internal improvement of his dominions, and re-established the Univ. of Turin on an extended scale; but the irresistible pressure exercised on him by Richelieu, forced him into a war with the Spaniards in Italy; and after routing his opponents at Tornavento (1636) and Montebaldone (1637), he died at Vercelli.

VICTOR-AMADEUS II., Duke of Savoy: 1666, May 14—1732, Oct. 31 (ruled 1675–1730): grandson of V. A. I. He was an able prince and an energetic administrator. In 1684, V. married Anne-Marie of Orleans, niece of Louis XIV., and daughter of Henrietta of England; but the overbearing insolence of the 'Grand Monarque,' who forced him to persecute the Waldenses (q.v.), and arrogantly ordered him to contribute an auxiliary force to the French army, and give up the citadel of Turin, drove him into a league with Austria and Spain against France. In revenge, a French army under Catinat assailed V.'s dominions, and though he was reinforced by 4,000 Austrians under his relative, Prince Eugene, the allies were routed at Staffarda (1690, Aug.), and the victorious Catinat completed the reduction of Savoy and Nice before the winter of 1691. The duke, aided by considerable reinforcements from Austria and Spain, gallantly maintained the contest; but a second and more disastrous defeat at Marsaglia (1693, Oct. 4), where he left 10,000 dead on the field, put almost the whole of Piedmont at the mercy of the French. The war, however, continued; the duke's obstinacy and almost romantic daring balancing Catinat's military genius; till in 1695 V.-A. accepted favorable proposals of peace which detached Savoy from the grand alliance. In the war of the Spanish Succession (q.v.), V. took part with France (1700) and was appointed commander-in-chief of the combined armies of France and Spain; but though he was aided by the counsels of his old opponent Catinat, the Austrians under his former ally Prince Eugene, defeated him at Chiari (1701, Nov.). In 1703 the tempting offers of Austria and Britain induced him to abandon France, and join the alliance against her. The French were routed by the duke and Prince Eugene under the walls of Turin, 1706, Sep. 7. In 1713 by the treaty of Utrecht (q.v.) Duke V.-A. was rewarded by receiving the rest of Montferrat, Val Sesia, Lomellino, and the island of Sicily, with the title of king; besides being acknowledged as heir to the Spanish throne, in case of the failure of the Bourbon dynasty. In 1720, Charles VI. of Spain persuaded him to surrender Sicily in exchange for Sardinia—an exchange which in later times proved most fortunate for the House of Savoy. The latter portion of V.'s long reign was employed in improving the administration, replenishing the exhausted treasury, encouraging agriculture and industry, and advancing educa-

tion. In 1730, the king abdicated in order to marry the Countess of San Sebastian, but attempting at her instigation in the following year to resume the crown, he was arrested and imprisoned, and soon afterward died.—His grandson VICTOR-AMADEUS III. (ruled 1773-96) was compelled by Napoleon's victories to cede Savoy and Nice to the French republic.

VICTOR-EMMANUEL *vĭk'tor ĕm-măn'ū-ĕl*, I. (Ital. *Vittore-Emanuele*), King of Sardinia: 1759, July 24—1824, Jan. 10 (reigned 1802-21); second son of Victor Amadeus III. Before his accession he bore the title Duke of Aosta. He was one of the most determined adversaries of the French Revolution; and on the outbreak of war 1792, he took the field in a vain contest. He opposed the peace with France 1796; and from this time absented himself from Turin till 1814. The treaty of Paris restored to him Piedmont, Nice, and half of Savoy, 1814; the treaty of 1815 added the remainder of Savoy, and the Congress of Vienna presented him with the duchy of Genoa—so that his little kingdom had profited territorially by its troubles. But the loyal delight of the Savoyards and Piedmontese at the return of their legitimate ruler was quenched by the early acts of his administration. The more liberal French institutions to which they had become accustomed were abolished, and the old absolutism was gradually restored. The restoration of old and hated abuses, and increasing taxation, excited discontent, which was heightened by the odious religious persecutions of the Vaudois and the Jews; secret societies were formed against the government; a revolution broke out 1821, Mar. 10. The army proclaimed the constitution promulgated by the Spanish Cortes 1812; and the king, rather than take the oath to it, resigned in favor of his brother, Charles Felix, Mar. 23.

VIC'TOR-EMMAN'UEL II., first King of a united Italy: 1820, Mar. 14—1878, Jan. 9 (king of Sardinia from 1849; king of Italy 1861-78); b. Turin; son of Charles Albert (q.v.) of Sardinia. He was a pupil of the Jesuits, but showed little interest in study. In politics he took no concern, but early showed himself a soldier. Commanding the brigade of Savoy in the campaign of 1848-9, he evinced great gallantry at Goito and Novara. On the evening of the battle of Novara, his father, seeing the hopelessness of the struggle, and unwilling to bow to the onerous conditions offered by Radetsky, abdicated in favor of V., who, being husband of Archduchess Adelaide (cousin of the Austrian emperor), and uncommitted to the views of the Italian ultra-democrats, might hope to obtain more favorable terms from the victorious Radetsky. V. thus ascended the throne of Sardinia—a kingdom nearly ruined—1849, Mar. 23; and restrained for a time the enthusiasm of the more ardent among the national party, though, on the other hand, he maintained with utmost fidelity the provisions of the liberal constitution granted by his father—having succeeded in procuring the withdrawal of the Austrian claim for its abolishment. His noble maintenance of this constitution won him the con-

fidence of the Italian people and ultimately won him the Italian throne. He curbed his passionate nature under misrepresentation and calumny; and steadily labored for an improved administration, rigid economy in the finances, care of the army, and encouragement to trade by commercial treaties with foreign nations. In securing as prime-minister 1852 Cavour (q.v.) V.-E. called to his side one of the greatest statesmen of the 19th c. Cavour—whom the king nobly trusted—saw clearly that, despite the intense and almost unanimous desire for unity throughout Italy, a contest single-handed with Austria was hopeless, and preferred, till a more convenient season, to withhold all seeming approach to such an object. The property of the state was sold; and various measures were adopted calculated to greatly diminish the privileges, and restrict within moderate limits the inordinate influence of the clergy—changes which brought on the king the thunders of the Vatican; but V., nothing daunted, protested by a vigorous 'memorandum,' and more obstinately asserted and maintained his independence, as a secular monarch, of the papacy. The revolt at Genoa was sternly suppressed; yet the king and his ministers were not displeased to see the feeling of nationality still vigorous; for, following the traditional policy of the House of Savoy, he was only biding his time. With the view of improving his position in Europe, and gaining a place at its council-board, he sent an army of 17,000 men, under La Marmora, to take part with England and France in the Crimean war; and visited (1855) the courts of Paris and London, where he was received with enthusiasm. After the peace of Paris (1856), he made closer alliance with France, gave his elder daughter Clotilde in marriage (1859) to Prince Jerome Napoleon; and backed by the French under Napoleon III., entered into a war with Austria to rescue the Italian territories from the Austrian yoke (see AUSTRIA—*History*). The campaign was brief but decisive—the Austrians were routed in every battle—notably at Magenta 1859, June 4, and at Solferino June 24; and the Italians were hailing with exultation the near fulfilment of their long-cherished dream of unity, when the suddenly concluded peace between France and Austria at Villa-Franca dashed their hopes to the ground. The Milanese (minus the fortresses of Mantua and Peschiera) only was added to the Sardinian monarchy, and for this the king ceded Nice and Savoy (the cradle of his race) to France as the price of its alliance. But the people of central Italy refused indignantly the offer of Prince Napoleon as their sovereign; and Tuscany, Modena, Parma, and the Romagna, renouncing their allegiance to their respective sovereigns, voted for annexation to Sardinia, and were formally adopted by V. as his subjects. This was a greater advance toward the unification of Italy than the French emperor wished; accordingly, V., who was still dependent on his ally for safety, though secretly favorable to Garibaldi's expedition to Sicily, disavowed all knowledge of this project; and after the island was conquered without a blow being struck by a single

Sardinian soldier, forbade the 'Italian Liberator' to pass over to the continent; yet he subsequently, with consent of Napoleon III., sent an army to aid Garibaldi in conquering Naples, and formally accepted the sovereignty of the two Sicilies. But in 1862, Garibaldi—thinking that the conquest of Rome in the same way would be equally acceptable to his sovereign—returned to Sicily, raised an army of volunteers, and was rapidly advancing on Rome, when V., forced by France, put an end to the expedition by capturing Garibaldi and his army at Aspromonte: see ITALY—*History:* GARIBALDI. Though proclaimed by the senate and house of deputies *King of Italy*, 1861, Feb., V. prudently postponed all attempts to annex Rome and Venice; and directed his attention to the internal affairs of his kingdom, which had been distracted by the intrigues of the sovereigns whom he had supplanted. At length, in the quarrel between Prussia and Austria for supremacy in Germany, appeared his opportunity; and an offensive and defensive alliance with Prussia was followed by an Italian invasion of Venetia 1866, June. The Italians were defeated in the bloody battle of Custozza; but the disasters which befell Austria in her simultaneous contest with Prussia forced the Austrian empire ultimately to surrender Venetia: see GERMANY—*North German Confederation.* In 1870, Aug., after the outbreak of the war between France and Germany, the last detachment of the French garrison which had occupied Rome since 1849 was withdrawn; the imperial city, finally united to the kingdom, became the cap. of Italy and the seat of V.'s court.—The last years of V.'s life were uneventful. He died after a short illness, and was succeeded by his son Humbert.

VICTO'RIA: city, cap. of Victoria co., Tex.; on the Guadalupe river, and on the Southern Pacific railroad; 40 m. n.w. of Indianola. It is an important shipping point for cattle, cotton, sugar-cane, and cereals; contains 9 churches, several hotels, steam grist and saw mills, and has 5 newspapers; had total valuation 1890 of $1,161,751, and receipts and expenditures in previous year of $11,452 and $10,460 respectively. Pop. (1870) 2,534; (1880) not reported; (1890) 5,216; (1900) 8,709.

VICTO'RIA: an 'original state' of Australia; smallest of the Australasian group, but the most important, taking precedence of all other British colonies and dependencies—India alone excepted.—Pop. (1890) 1,133,000 (see below, *Population*).

Geographical Position and Extent.—V. comprises the s.e. corner of Australia, at that part where its territory projects furthest into cool s. latitudes. Wilson's Promontory, to the s.e., the most southerly headland, just passes 39° s. lat.; while the most northern point, at the n.w extreme, is in s. lat. 34°: long. 141°—150° e. of Greenwich. To the w. is the state of S. Australia; to the n. is New South Wales, separated by the line of the Murray river estward from 141° e. long. to its source, and thence by a straight line s.e. to Cape Howe; and from Cape Howe to S. Australia again, the state is bounded s. by Bass's strait; extreme length e. and w. about 480 miles, extreme width, n. and s., about 250 m. A remarkable indentation of both the n. and s. boundary opposite each other, about the middle of the state, reduces the breadth between the head of the Port Phillip inlet and the Murray to only 120 m. Area 56,245,760 acres, or 87,884 sq. m.—not quite twice the area of Pennsylvania. Coast-line about 800 m.

Physical Aspect.—Although V. may be called mountainous as compared with the general flatness of Australia, it has much of the quiet and peculiar Australian scenery. Vast naked plains are deviously traversed by broad and deep river-channels, though the rivers, except in winter and spring or after heavy rains, mostly are mere chains of pools, if not altogether dry. Overspread, in cool and moist seasons, with brilliant verdure, the drought and heat of summer quickly convert the grass into a natural hay, which, in the scarcity of sustenance from its ceasing to grow in that condition, is eaten off to the very roots by the sheep and cattle, leaving the surface bare and blackened. The 'open forest,' characteristic of Australian scenery, is largely prevalent. It distinguishes the gently undulating country of the better soils, whose surface is overspread by large trees, chiefly of the red gum (*eucalyptus*) and silver wattle (*acacia*); the trees being widely apart and of spare foliage, and the surface free from underwood, there is usually a good growth of grass, the whole presenting a park-like aspect, though with the usual lack of water. Mountain and forest prevail most in the e. division, where the Australian Alps of Gipps' Land, loftiest of Australian chains, present peaks ranging from 1,000 to 6,500 ft. above sea-level. The w. district is remarkable chiefly for numerous isolated hills of volcanic origin, some with craters still perfect, which probably have not, in a geological sense, been very long at rest. To this extensive volcanic system, V. owes the large proportion of its good arable land, as compared with the light sandstone and granitic soils elsewhere in Australia. The chief rivers, besides the Murray and its branches (see AUSTRALIA), are the Snowy River, Tambo, Mitchell, Macallister, and La Trobe—all of Gipps' Land; also the Yarra-Yarra, and the Goulburn. The Australian

fauna is very remarkable; notably the kangaroo or pouched family, and the emu or great wingless bird. There are besides the *echidna* and *platypus*, even more singular in structure, especially the last. The dingo, or native dog, is remarkable as a non-marsupial exception.

Climate.—This is on the whole healthful and agreeable, but subject to frequent and sudden change. The average temperature of the year is 57°–59°, or about 9° above that of London. The common summer-heat is 65°–80°, with occasional advance to 90° and even to 100°–108° during hot winds and a dry season. The winter-range is mostly 45°–60°. Ice occurs in the midwinter of July, but rarely, except on elevated ground, survives the noonday sun. Every few years an unusually severe season covers the higher levels, and even the country generally, with snow. The cold of winter is keenly felt.

Civil and Political Divisions.—V. is divided into four districts and 37 counties, the principal counties being Bourke, Talbot, and Grant. 'Squatting' is still an important colonial vocation, second only to gold-mining. The electoral districts in general (but not always) coincide with county and municipal divisions, as regards the assembly; but for the council or upper house there is (since 1882) a division of the state into 14 districts. For local self-government, there are, besides counties, about 60 cities, towns, and boroughs, and about 150 'shires.'

History.—The first settlement was due to colonists from Launceston, Tasmania, who occupied the s.w. part at Portland Bay with flocks of sheep 1834. But the first important settlements were in 1835 at and near Melbourne, also by small parties from Launceston. The progress has been marvellous. When the gold mines were discovered, the settlement, after 16 years' existence, had a colonial population of 80,000, nearly one-third in the capital. Thenceforth for several years the imports, exports, and public revenue increased tenfold. In 1856 Melbourne (q.v.) had become a city of great wealth and commerce, pop. 100,000; while the pop. of the colony was 400,000. In 1901 the pop. of Melbourne (with suburbs practically one with the city proper) was 496,079. Some interior towns, besides, are rising to importance—Geelong (25,017), Ballarat (49,414), Sandhurst or Bendigo (41,898), the last two being the principal gold-field towns.

V. was separated from New South Wales 1851, and received its present name. Self-government was conceded to the colony, and was enthusiastically inaugurated 1854–56, with results in the highest degree beneficial. In less than 20 years thereafter this enterprising colony held an international exhibition on a large scale in its own capital (1880–1), visited by more than a million of people.

Population.—Pop. (1871) 731,528; (1881) 849,434: (1890) 1,133,000; (1901, March 31) 1,201,341. The people, in common with those of the other states of the group, are in the main British; about one-half were born in the state, and somewhat less than one-third in the Brit. Isles. The aborigines probably never numbered more

than 15,000. The Germans are the only other foreign element of any noticeable strength: they began to arrive 1849. Assisted immigration, in vogue in the early days of the colony, has practically ceased; as the govt. of V. found it desirable to receive a more self-reliant and industrious class of workmen.

Religion.—Until 1875 a yearly dotation of £50,000 for support of religion was distributed ratably among the sects—including the Jews. Some of the denominations, on principle, refused this governmental subsidy; and the growing disapproval led to the total abolition of the grant in aid 1875. The census of 1891 showed the membership of religious denominations as follows: Chh. of England 417,182; Presb. 167,027; Meth. 158,040; other Protestants 94,608; Rom. Cath. 248,591; Jews 6,459; Buddhists, Confucians, etc., 6,746. In 1901 the Episcopalians numbered 432,732; R. Cath., 263,712; Presbyterians, 191,471.

Commerce.—The staple articles of export are wool and gold. The exportation of wool 1880 was valued at £6,507,765; of gold £3,887,534. The gold discoveries 1851 brought a sudden and extraordinary commercial development: for that year imports had been £1,056,437, exports £1,422,909; in 1854 the amounts were respectively £17,659,051 and £11,775,204. This rate of increase was, of course, not maintained. Imports (1880) £14,556,894; exports £15,954,559; 1901 imports £18,927,340, exports £18,646,097. The import of articles, the product of Great Britain amounted (1901) to the value of £7,221,801; the export from V. to Great Britain £5,425,772. See *Gold mining*, below.

Squatting.—This colonial term has long since passed from its originally semi-savage and outcast associations to represent in Australia the condition of a sort of rural aristocracy. The squatter, using the country as he found it, placed on it his live-stock, which lived and throve on the natural herbage. This ready adaptation of the surface, with comparatively little of preliminary outlay, is the chief cause of Australia's rapid progress. At first the pastoral 'stations,' or 'runs,' were uninclosed areas, parcelled out to a small number with a bountiful hand, and at a nominal rent or occupation license-fee. Now these areas have been much subdivided, and in many cases fenced. In 1880 there were in the colony 216,710 horses, 1,129,358 head of cattle, 8,651,775 sheep, and 144,733 pigs.

Agriculture.—Comparatively little was accomplished in this branch until 1860, when the government began to increase the facilities for acquiring and cultivating the public lands. In 1861 there were but 180,000 acres under the plow; (1902) 3,810,000 acres. The dry climate of s. Australia seems highly favorable to the quality of wheat. The wheat (1902) was 12,127,000 bush. Vine-culture rapidly extends, and wine-making is now general.

Manufactures.—The manufacturing industry of the state is extending, and the state is fully committed to the principle of a heavy protective tariff. In 1901 there were 3,249 various manufacturing establishments, employ-

ing 66,529 hands. A branch of the royal mint was opened 1872. Meat-preserving is carried on on a large scale; and there are very large paper-mills near Geelong. A little coal is produced in the state.

Gold-mining.—This may now be termed one of the skilled labors of the state; but it is no longer, on an average, among the most remunerative. Of the two great branches of mining—(1) the crushing of the auriferous rock for washing out the gold, (2) the washing from the *débris* or 'drifts' which nature has already pounded down—the latter, as a simpler process, was at first the most general; but lately the other has been increasingly followed. The gold product has gradually diminished from (1856) £12,000,000 to (1901) about £3,106,000. The total value of gold raised, from the discovery of the gold-fields (1851) to 1901, was about £260,000,000. Usually the greater part of the gold is sent to Britain direct; though the proportion varies greatly, depending on the state of the exchange with India. In 1889 the gold-fields of V. comprised 330 sq. m. The value of gold-mining machinery of all kinds, including 1,119 steam-engines and 15 diamond drills, was $8,945,-235. The total product, shipped to the Melbourne mint, was 623,800 oz.

Railways.—The system is more extensive, and complete than in any other of the southern colonies. At the end of 1900 there were 3,221 m. of railway open for traffic, and more in construction.

Finances.—The public revenue is derived mainly from customs dues, excise, land sales and rents, and public works. The total revenue of V. (1880-1) amounted to £5,115,121. The chief items were: customs £1,481,018; excise and inland revenue £508,805; land sales £833,146; public works (chiefly railway receipts) £1,700,464. The revenue (1902-3) was £6,694,080; expenditure £7,050,358. The outstanding public debt amounted 1880 to more than £20,000,000; about £16,000,000 of which was incurred for railways, all of which now belong to the state, traversing the state from Port Phillip to the river Murray. The remainder is the cost of water-supply to Melbourne and other parts of the state, and of aids to Melbourne and Geelong for town improvements. The debt (1901) was £50,013,552. The customs revenue is derived mainly from railways, customs and duties; there are moderate duties on sugar, tea and coffee, and various other articles. Municipal and road-district taxation are additional.

Political Institutions.—V. has almost entire autonomy. There is a parliament of two houses: the upper house (legislative council) consists of 45 members (unpaid); the lower house (assembly) 95 members, paid at the rate of £300 annually. A general election must be held every three years; and all voting is by secret ballot. The upper house is elected by voters of special qualification; the assembly by manhood suffrage. The governor represents the Brit. sovereign, who appoints him; and he governs by ministries, who are of the crown's, that is, of the governor's, nomination, but who must possess the confidence

of parliament. The term of the governorship is usually seven years; the present salary of the office is £5,000 a year. In salary, the Victorian appointment, though an important one of the colonial list, is exceeded by the gov.-generalship of Canada (which is £10,000) and the gov.-generalship of India.

Education.—A nat. system, to compete with the previously established denominational, had been early introduced into New South Wales and V. National and denominational schools, each conducted by a separate board of management, were alike aided by the state. The institution of a partially national system, and of a single board, was carried in the legislature 1862. That system was, in effect, that all state-assisted schs. must be open to the children of all religious bodies, and that four hours daily of secular teaching be imparted to every pupil. This arrangement, on experiment, was unsuccessful. Schools still remained in connection with the several denominations; denominational school committees controlled the election of teachers, who were also permitted to impart religious instruction where desired. As a result, schools were unnecessarily multiplied in some localities, and the money of the state was wasted in their support. After various attempts to establish a system of state schs. unconnected with any denomination, the government at last overcame all difficulties, and a bill passed both houses of the legislature which completely establishes a nat., as opposed to a denominational system of education. The total number of public schools in V. was (1900) 1,948, attendance 243,667; 884 private schools, with 51,834 scholars; besides 18 technical schools, various colleges, and the Melbourne University.

VICTORIA: seaport of Brazil, cap. of the prov. of Espirito Santo, 270 m.n.e. of Rio de Janeiro; lat. 20° 18′ s., long. 40° 20′ w., at head of the Bay of Espirito Santo, whose entrance is defended by 5 forts. V., founded 1535, was called Espirito Santo until 1558, when V. was adopted to commemorate the defeat of the allied Indians. Rice, sugar, and manioc are grown in the neighborhood. —Pop. 7,000.

VICTORIA, *vĭk-tō′rĭ-a:* city, cap. Victoria dist. and of the prov. of Brit. Columbia; on San Juan de Fuca Strait; at the s. e. end of Vanconver Island, opp. the entrance to Puget Sound, and at the terminus of the Esquimault and Nanaimo railroad; popularly called 'the Newport of the Pacific coast.' It is a port of entry, transhipps a vast amount of merchandise from ocean to river boats, and has daily steamboat connection with Tacoma, Wash., and all important points on Puget Sound, Strait of Georgia, and Fraser river, and fortnightly steamship connection with San Francisco. The city is on a picturesque harbor, too shallow for large vessels, and its principal residences and public buildings are beyond James's Bay, one of two branches of the harbor. An inlet from Rock Bay—the other branch—is called 'the Arm,' and is the scene of aquatic and athletic sports. On the point

which extends outward to form the harbor is Beacon Hill Park, a spot of great natural beauty. Broad macadamized roads afford charming drives in many directions. Esquimault, 3½ m. w., with a deep, commodious, and securely sheltered harbor, has been for many years a noted British naval station. It is the point of nearest approach to V. for large vessels. V. has costly water-works, gas and electric light plants, several banks, extensive ship-yard, distilleries, breweries, theatres, hospital, and daily and weekly newspapers. The principal buildings are the Bank of British Columbia; the headquarters and store of the Hudson Bay Co.; the colonial govt. buildings, comprising the treasury, land-office, printing-house, museum, and assembly chamber—all in a pretty park; Cary Castle, official residence of the gov.; Dunsmuir Castle; and the barracks of the volunteer and regular garrison.—In 1843 V. was a trading-post of the Hudson Bay Co.; 1859 it was made the cap. of the new colony of Vancouver Island, and 1866 the cap. of the newly annexed colony of Columbia.—Pop. (1881) 5,925; (1891) 25,000; (1901) 20,816.

VICTO'RIA: chief town of the Brit. island and colony of Hong-Kong: see HONG-KONG.

VICTO'RIA I., Queen of the United Kingdom of Great Britain and Ireland, and Empress of India: b. 1819, May 24, at Kensington Palace; daughter and only child of Edward, Duke of Kent, 4th son of George III.: her reign began 1837. Her mother, Victoria Mary Louisa, was 4th daughter of Francis, Duke of Saxe-Coburg-Saalfeld, and sister of Leopold I. (q.v.), King of the Belgians. The first husband of Princess V.'s mother, the Prince of Leiningen, died 1814; and 1818, July 11, she married the Duke of Kent at Kew. The duke died 1820, Jan. 23, leaving his widow in charge of an infant daughter only eight months old, baptized Alexandrina Victoria The infant princess, as she grew up, was taught to seek health by exercise and temperance, to acquire fearlessness even from her amusements, such as riding and sailing, and to practice a wise economy united to a discriminating charity. After a few years, the Duchess of Northumberland was associated with her mother in her nurture and education. The Princess V. became accomplished in music, drawing, and the continental languages; and acquired a knowledge of some of the sciences, particularly botany. Her father having been a whig, her political education was naturally derived from the members of that party; and Viscount Melbourne (q.v.) was her instructor in the principles of the British constitution. She ascended the throne of the United Kingdom on the death of her uncle, William IV. (q.v.), 1837, June 20—her uncle, the Duke of Cumberland, becoming king of Hanover, in virtue of the law which excludes women from the throne of that country. By this event, the connection which had lasted 123 years between the crowns of England and Hanover was terminated Victoria was proclaimed 1837, June 21, and crowned at Westminster, 1838, June 28. She found on her accession Viscount Melbourne at the head of the govt.; and during his premiership and with the cordial assent of her subjects,

the young queen was married at St. James's Palace, 1840, Feb. 10, to Prince Albert (q.v.), Prince of Saxe-Coburg and Gotha, second son of the duke then reigning. Her majesty had issue—four sons and five daughters: the Princess Royal, Victoria, b. 1840, Nov. 21, married, 1858, Jan. 25, to Frederick William, Crown Prince of Prussia, and Prince Imperial of Germany (see FREDERICK I. of Germany); Albert Edward, Prince of Wales, heir-apparent to the throne of the United Kingdom, b. 1841, Nov. 9, married, 1863, Mar. 10, Princess Alexandra, eldest daughter of Christian IX, King of Denmark; Princess Alice, b. 1843 Apr. 25, married, 1862, to Prince Frederick William of Hesse (she died 1878, Dec. 14); Prince Alfred, b. 1844 Aug. 6., created Duke of Edinburgh 1866, married, 1874 Jan. 23, Marie, only daughter of the Emperor of Russia, Helena, b. 1846, married, 1866, to Prince Christian of Denmark; Louisa, b, 1848, married, 1871, to the Marquis of Lorne (q.v.); Arthur, b. 1850, created Duke of Connaught 1874, married, 1879, Princess Louise Marguerite of Prussia; Leopold, b. 1853, created Duke of Albany 1881, married Princess Helena of Waldeck 1882 (he died 1884); Princess Beatrice, b. 1857, married, 1885, to Prince Henry of Battenberg. She died in the Isle of Wight, 1901, Jan. 22.

For the changes of administration in this reign see GREAT BRITAIN: MELBOURNE: PEEL: RUSSELL: DERBY: ABERDEEN: PALMERSTON: GLADSTONE: DISRAELI: SALISBURY. The legislative measures of greatest importance were the establishment (1840) of the penny-postage (see POST-OFFICE); the amendment of the Poor Laws in Scotland (1845) and Ireland (1847); the abolition (1846) of the Corn Laws (q.v.), and (1849) of the Navigation Laws (q.v.); the Irish Encumbered Estates Act; the transfer (1858) of the Indian possessions from the E. India Company to the crown (see INDIA); the admission (1858) of Jews into the house of commons; the Reform Act of 1867; disestablishment of the Irish Church (1869); the Irish Land Acts (1870 and 81); the abolition of purchase in the army (1871); the Education Acts (England 1870, Scotland 1872); the Representation of the People Act (1884); and the Redistribution of Seats Act (1885). See NATIONAL EDUCATION. Other memorable events in this period of British history were the discovery of the Northwest Passage (q.v.) by Sir Robert M'Clure (1850); the Exhibitions (q.v.) of 1851 and 62; the discovery of gold in Australia (q.v.) and in British Columbia; the war (1854–56) with Russia (q.v.) in defense of Turkey (q.v.), in which the siege of Sebastopol was a chief event; the Indian Mutiny 1857 (see INDIA); the Volunteer (q.v.) movement (1859); the establishment (1866) of telegraphic communication with America (see TELEGRAPH); the Abyssinian war 1867 (see THEODORE); the formation of the Dominion of Canada 1867; the wars with Ashantees (1873), Zulus (1879), and Afghans (1878–80); the rising in the Transvaal; the agitations in connection with the Fenian Soc. (q.v.), Home Rule (q.v.), and the Land League; the passing of the Land Act (1881); and the war in Egypt (1882). In 1848 the only disturbance in Britain was a

Chartist demonstration (see CHARTISM); while, during V.'s reign, France (q.v.) was successively a constitutional monarchy, a republic, an empire, and again a republic; the great civil war in the United States of America (q.v.) resulted in the extinction of slavery; the formation of the kingdom of Italy (q.v.) was completed by the acquisition of Venetia and Rome; the unification of Germany, begun by the formation of the N. German Confederation, as the result of the war between Prussia and Austria (1866) was consummated by the events of the Franco-Prussian war (1870-1); the war (1877) between Russia and Turkey led to sweeping changes in the Balkan Peninsula (see TURKEY); and the Boer war, begun in 1899, and followed by the annexation of the South African Republic and Orange River Colony, altered the map of Africa.

In 1876 the title 'Empress of India' was added to the royal titles of the queen. The death of the prince-consort (1861) caused Queen V. to seclude herself for many years from public life. The queen published two vols.: *The Early Days of H. R. H. the Prince-Consort: Leaves from the Journal of Our Life in the Highlands* (1869); and *More Leaves from the Journal* (1884).

V.'s golden jubilee was celebrated with much splendor (1887, June 20) at Westminster Abbey, and the queen laid the corner-stone of the Imperial Institute. The popular enthusiasm on this occasion plainly manifested the love of the people for their sovereign, and their undiminished attachment to the monarchy. The deaths in 1888 of Emperors William and Frederick, of Germany, cast a gloom over the English court. In London the Metropolitan Board of Works was superseded by the London County Council. The death of John Bright q.v.) in 1889 removed one of the greatest of England's orators. The collapse of the great house of Baring Brothers (1890) caused a crisis in commercial affairs; in the political world events concerning Charles Stewart Parnell led to the disruption of the Irish party. In 1891 Mashonaland was successfully colonized by the Brit S. Afr. Co., and there was a commercial crisis in Australia. The year 1892 was saddened by the death of the Duke of Clarence, the eldest son of the Prince of Wales. A vote of 'no confidence' in the govt. led Lord Salisbury to resign and Mr. Gladstone again became premier; the deaths of Cardinal Manning. Charles H. Spurgeon, and Lord Tennyson caused much sorrow. In 1893 Gladstone introduced his second Irish home-rule bill, which passed the commons but was rejected by the lords. On May 10 the queen opened the Imperial Institute. In July the marriage of George, Duke of York, to Princess Victoria Mary of Teck was celebrated with great rejoicing. Mr. Gladstone resigned the premiership (1894) in favor of Lord Rosebery. The Manchester Ship-canal was opened formally by the queen, May 21. A son was born to the Duke of York, June 23, thus strengthening the direct line of succession. Disagreements in the liberal party (1895) resulted in the defeat of that party and the return of Lord Salisbury to power. Later, the Duke of Cambridge resigned the office of commander-in-chief. Lord Acton was ap-

pointed Regius Prof. of Modern History at Cambridge, the first Rom. Cath. prof. in that univ. since the time of James II. The territory of the Brit. East African Company became a British protectorate, and at the close of the year a pronouncement by Pres. Cleveland on the Venezuelan boundary dispute (q.v.) caused considerable feeling in England. In 1896 interest shifted to S. Africa, where Dr. Jameson made an unsuccessful raid on the S. African Republic (q.v.). Prince Henry of Battenberg died this year. The visit of the Czar of Russia to the queen at Balmoral (1896) bore, it was suggested, on the outrages in Armenia. But the greatest event of Queen V.'s reign was the celebration of her Diamond Jubilee (1897, June 21-26). This event was marked for its grandeur and for the spontaneous outpouring of the nation's heart. The welcome accorded the queen showed the intense pride of the people in their sovereign and manifested greater reverence and affection than ever before. Representatives of every civilized nation were present, the United States being represented by the Hon. Whitelaw Reid, Gen. Nelson A. Miles, U.S.A., and Rear Admiral J. N. Miller, U.S.N. A naval review—the greatest display of naval power ever seen—was held at Spithead (June 26), when England, without drawing a single vessel from her many foreign stations, placed 170 war-ships in line.

'In Queen Victoria,' according to Macaulay, 'her subjects have found a wiser, gentler, happier Elizabeth.' No former monarch has so thoroughly comprehended the great truth that the powers of the crown are held in trust for the people, and are the means, and not the end, of government. This enlightened policy has entitled her to the glorious distinction of having been the most constitutional monarch that any country has ever seen. Not less important and beneficial has been the example of her majesty and her late consort in the practice of every domestic virtue. Their stainless lives, their unobtrusive piety, and their careful education of the royal children, have borne rich fruit in the stability of the throne, and have obtained for the royal family of England the respect and admiration of the civilized world. See Theodore Martin's *Life of the Prince-Consort;* Sidney Lee's *Queen Victoria* (1902).

The progress made by the nation in the various elements of civilization, especially in material prosperity, has been unparalleled (see GREAT BRITAIN); and perhaps during no reign has there been greater political contentment.

VICTO'RIA: genus of plants, nat. order *Nymphæaceæ*, resembling the common water-lily, but most nearly allied to the genus *Euryale*, and distinguished from it particularly by the deciduous tips of the calyx, and the sterility of the innermost stamens. Only one species is known, *V. regia;* said to have been observed first by Hänke about 1801. It was described by Pöppig 1832, who observed it in the river Amazon; and it has since been found in many rivers of the n.e. of S. America. Its leaves are orbicular, float upon the water, and attain a diameter of 5-6 ft.; have the margin turned up, about two inches high; are of purplish color on the underside, and there exhibit a sort of

wicker-work of very prominent veins, furnished with prickles. The flowers rise among the leaves upon prickly stalks: they are more than 12 in. in diameter, white, internally rose-colored, and very fragrant. The fruit is a capsule, almost globose, with a depression on the top, about half the size of a man's head, fleshy within, and divided

Victoria regia, flower and leaf.

into numerous cells, full of round farinaceous seeds, which are an agreeable food: the plant is therefore called *Maïs del Agua*, or 'Water Maize,' in parts of S America. For cultivation of this plant, special hot-houses have been built in some places in Europe, and it has been introduced into India from seeds produced in England.

VICTO'RIA BRIDGE: tubular bridge spanning the St. Lawrence at Montreal, on the Grand Trunk railway of Canada. This, the greatest tubular bridge in the world, was begun 1854, May, and finished 1859, Dec. See TUBULAR BRIDGE: BRIDGE.

VICTO'RIA FALLS: see ZAMBESI RIVER AND REGION.

VICTO'RIA LAKE, or ALEXANDRINA, or KAYINGA LAKE: brackish lagoon in the s.e. of S. Australia; separated from the sea by a narrow strip of land. It receives the rivers Murray, Bremer, Angus, and Finnis; and communicates with the sea by a narrow passage into Encounter Bay. It is 30 m. long, and about 12 m. wide. The entrance to the lake is obstructed by a sand-bar.

VICTO'RIA NYAN'ZA: immense fresh-water lake in central Africa, the main reservoir of the Upper Nile. Crossed near its n. end by the equator, and bisected by the meridian 33° e., it measures about 230 m. n. to s., and somewhat less e. to w.; about 27,000 sq. m (nearly as large as the state of Maine). This area includes numerous islands; the larger ones, e.g., Ukerewe, Sesse, Usuguru, having considerable population. The surface of the lake is more than 4,000 ft. above sea-level, 1,400 ft. higher than Tanganyika (q v.); and though the V. N. is not so deep as Tanganyika, it is in places 500 to 600 ft. in depth. The water is good and fresh, in some places of a dirty white color. The shores are generally low and fertile, ascending toward hills at no great distance. At the

s. end of the lake, the Shimiyu, the southernmost head-stream of the Nile, enters; and the chief affluent of the V. N. is the Kagera or Kitangule, from the w. Stanley 1889 discovered a great southward extension of the V. N.—a large bay behind a line of mountain-islands at the s.w.—carrying the southern limit of the lake to 2° 48′ s., only 155 m. from Lake Tanganyika.—The Nile (see NILE, with map), here called Victoria Nile or Somerset river, leaves the lake at its n. extremity by the Ripon Falls, 12 ft. high and 400 or 500 ft. wide. The lake was discovered 1858 by Capt. Speke (q.v.), and explored by him and Grant, Baker, Stanley, and the missionaries established in Uganda, Mtesa's kingdom, on the n.w. shore of the lake. Other names for the lake, Nyanza meaning water or lake merely, are Nyanza Ukerewe and Luta Nzige, a name applied also to the *Albert Nyanza* (q.v.), another lake w. of the Victoria Nyanza.

VICTO'RIA UNIVER'SITY: see OWENS COLLEGE.

VICTUAL, n *vĭt'l*, now generally in plu., VICTUALS, *vĭt'lz* [F. *victuaille*, provision—from mid. L. *victuālĭa*, victuals—from L. *victus*, mode of living, provisions; *vivĕrĕ*, to live]: provision for food; articles commonly used as food: V. to supply with provisions or articles of food; to store with provisions, as a ship. VICTUALLING, imp. *vĭt'l-ĭng*. VICTUALLED, pp. *vĭt'ld*. VICTUALAGE, n. *vĭt'l-āj*, victuals. VICTUALLER, n. *vĭt'l-ĕr*, one who keeps a victual-house; an innkeeper or tavern keeper; a seller of intoxicating liquors by retail, usually called a *licensed victualler;* one who sells grain; in the *Brit. navy*, a provision-ship. VICTUALLING-YARD, a yard either contiguous to or forming part of a dock- or navy-yard, where vessels of the navy are 'victualled' or provisioned.

VICUGNA, or VICUÑA, n. *vĭ-kōn'yă* [Sp. *vicuña*—from Peruvian]: animal of Mexico and Peru, akin to the camel, but smaller, belonging to the genus *Auchenia;* a species of the llama or alpaca tribe furnishing a long reddish wool. In size it is intermediate between the llama and the alpaca. Its neck is longer and more slender; its wool is finer, and is short and curled. The V. is of rich brown color, with patches of white across the shoulders and on the inner side of the legs. It inhabits the most desolate parts of the Cordillera, at great elevations; and delights in a kind of grass, the Ychu (*Stipa Ychu*), which abounds there in moist places. It seldom ventures to the rocky summits, its tender feet being ill adapted for mountain-climbing. It is found usually in small herds of 6 to 15 females with one male. When the females are quietly grazing, the male stands apart and keeps guard, giving notice of danger by a kind of whistling sound and a quick movement of foot. When the herd takes to flight, the male covers its retreat, often pausing to observe the motions of the enemy. If he is wounded or killed, the females gather round him, and will suffer themselves to be captured or killed, rather than desert him. The V. is a very active animal, like the wild goat or the antelope. The Indians seldom kill it with fire-

arms, but set up a circle of stakes, about a mile in circumference, into which the vicugnas are driven —A hybrid has been produced between the V. and the alpaca, which has a black and white fleece of long wool, resembling the richest silk.

VIDA, *vē'dâ*, MARCO GIROLAMO: Latin poet: about 1485–1566, Sep. 27; b. Cremona. He studied theol. in Padua and Bologna, and became canon of St. John Lateran, Rome. He was promoted to the episcopal see of Alba 1532. V. wrote the *Christias* (6 books) and other epics; also several didactic poems, among them *De Arte Poetica*. His poem *Scacchiæ Ludus* (the game of chess) was transl. into English by Oliver Goldsmith.

VIDE, v. *vī'dē* [L. impera. of *vidĕō*, I see]: see; look at; indicating reference to some other place or thing; as *vide, supra*, 'see above'; *vide ante*, 'see before'; *quod vide* (usually abbreviated (*q.v.*), 'which see,' etc. VIDELICET, ad. *vī-dĕl'ĭ-sĕt* [L.—from *vidērĕ*, to see; *licet*, it is allowed]: to wit; namely; that is to say; the contracted form, VIZ., is in much more common use. VIDIMUS, n. *vī'dĭ-mŭs* [L. we have seen—from *vidĕō*, I see]: a view or inspection; an abstract or summary of documents, accounts, and the like.

VIDETTE, n. *vĭ-dĕt'*: also spelled VEDETTE (q.v.).

VIDIMUS: see under VIDE.

VIDOCQ, *ve-dok'*, FRANÇOIS-JULES: noted Parisian detective officer of police: 1775, July 23—1857, May; b. Arras, where his father was a baker. As a boy, employed in his father's shop, he persistently robbed the till: he was sent to the house of correction; but signalized his return to business by decamping with about $400. Of this money a sharper relieved him at Ostend; and he engaged himself to sweep the cages of a travelling menagerie, from which service he was advanced to the post of tumbler and acrobat. Having disagreed with the manager, he entered the army, attained the rank of corporal, and served with some credit in Belgium and elsewhere, till a wound compelled his return home. Then for some years he seems to have lived as a scoundrel at large, occupied in swindling and in disreputable love-affairs. In 1796, in Paris, he was detected in forgery, and sentenced to eight years as a galley-slave. Before his term had expired, he escaped and became one of a band of highwaymen, who, it is said, having discovered that he was an escaped galley-slave, rid themselves of V.'s company, exacting from him an oath not to betray them. V. took the oath very solemnly, and proceeded at once to deliver the whole gang into the hands of the authorities. This exploit seems to have suggested to him the *rôle* which he afterward developed. Proceeding to Paris, he offered his services to the authorities there as a spy on the criminal classes. At first coolly received, he gradually made his way; and ere long his services became so important that he received official recognition. In 1812 a 'Brigade de Sûreté' was organized, with V. as chief. Consisting at first of only 4 men, by degrees it was enlarged to 28; and its efficiency was marvellous. Suspicions, however, grew

rife that V. was himself the originator of many of the burglaries he showed himself so clever in hunting out, and even contrived to make a good thing of them. This charge, though not in any case clearly proved, had inherent probability; and so strong was the popular feeling against him that he was dismissed 1825. He became a paper-manufacturer; and 1834 established a society to furnish confidential information as to parties in trade whose credit was doubtful. In 1829 he published an Autobiography, and a *rédaction* of it 1844 (Eugène Sue's famous novel having just taken the public by storm), under the title *Les Vrais Mystères de Paris.*

VIDUAGE, n. *vĭd ū-āj* [L. *vĭdŭus*, widowed]: the state of being a widow. VIDUITY, n. *vĭ-dū'ĭ-tĭ* [L. *vĭdŭĭtas*]: in *OE.*, widowhood.

VIE, v. *vī* [a metaphor taken from the language of gamesters, with whom It. *invitare*, F. *envier*, was to invite to throw for certain stakes: It. *invito*, an inviting, a vie or saying at play: OE. *a-vie*, as if for a wager· thus *vie* is merely a doublet of *invite*, which see]: to strive for superiority; to use effort in a contest or competition, followed by *with;* in *OE.*, to urge; to practice in rivalry; to hazard; to wager: N. in *OE.*, contest; competition; wager. VYING, imp. *vī'ĭng.* VIED, pp.

VIELE, *vē'lā* EGBERT LUDOVICKUS: civil engineer and soldier: b. Waterford. N. Y., 1825, June 17. He was educated at West Point; and being assigned to the 2d U. S. infantry, served with that command in the Mexican war. He resigned his commission as 1st. lieut. 1850, and settled as civil engineer in New York; he was state engineer of N. J. 1854–56; was chief engineer of the New York Central Park 1856–60. Then he was chief engineer of the Prospect Park, Brooklyn, N. Y., till the outbreak of the civil war, when he entered the volunteer service. He served first in the defenses of Washington as capt. of engineers in the 7th N. Y. regt. He was commissioned brig.gen. of vols. 1861, Aug. 17, and established a camp of instruction in Westchester co., N. Y. He commanded the force that captured Ft. Pulaski, at Savannah, 1862, then took Norfolk, Va., and was milit. gov. of Norfolk 1862, May—1863, Oct.; he then returned to civil life in New York. He was representative in congress 1884–86. He has pub. numerous papers on engineering, sanitary science, etc.

VIENNA, *vē-ĕn'a* (Ger. *Wien*, L. *Vindobona*, afterward *Faviana*): city, cap. of the Austrian empire; on the right bank of the Danube; lat. 48° 13′ n., long. 16° 23′ e.; on a plain at the foot of the outlying spurs of the *Wiener Wald*, the e. extremity of the Alps, but at a height of 550 ft. above sea-level. Eastward a vast plain extends as far as the Carpathians, which are visible on a clear day. On the n. the hills approach within about 6 m., and extend uninterruptedly to the Tyrolese Alps in the w. An arm of the Danube (called a canal) passes along the n.e. side of the city, and separates it from the suburb of Leopoldstadt. Into this arm flows the foul and (when not swollen by rains) insignificant stream called the Wien, from which the city takes its name. V. consists of the old city or inner town, called the *Stadt*, with narrow and irregular streets; and of a circle of nine suburbs, completely surrounding it. Around the *Stadt*, and separating it from the suburbs, is a space on which were formerly the fortifications (levelled 1858). This space has been largely covered with buildings, of which the principal form part of the Ringstrasse, a handsome boulevard, in many places more than 200 ft. wide. Besides the old fortifications above mentioned, there is an external ring with rampart and fosse, still preserved as the boundary of the city imposts: these fortifications are called the *Lines*, and formerly encircled both suburbs and city; the suburbs are now, however, rapidly extending outside. Unlike most other European cities, the old part of the city is the most fashionable. In the *Stadt* are the palaces of the emperor and of some of the principal nobility, many stately mansions, the public offices, the finest churches, most of the museums and public collections, the colleges, the exchange, and the best shops. Since the erection of the Ringstrasse and other buildings on the site of the old glacis, many of the aristocracy have removed thither. The suburbs are laid out in wide streets, many of which, being unpaved, are very dusty in summer and very muddy in winter. As a rule, the houses are let in 'flats,' almost the only exception being the palaces of the higher nobility; and in some cases even these consist of only the two lower stories of the building. Among principal squares are the *Josephsplatz* and the *Burghof* (the latter the court of the palace); the outer *Burgplatz*, laid out with grass and flowers, and in which stands the *Burgthor;* the *Neuer Markt*, *am Hof*, and *Freiung*. The three last mentioned are in the heart of the city, contain many picturesque buildings, and are otherwise interesting.

V. is the see of an archbishop; and the chief of its many churches is the Cathedral of St. Stephens, 354 ft. long, 229 ft. wide, 80 ft. high, with a very beautiful tower, 450 ft. high, erected 1860–64 to replace the former structure, which was removed as being unsafe. The choir was begun 1359; the nave dates a century later. The church of the Augustines is remarkable for its monument of Archduchess Christina of Saxe-Teschen, one of the most successful works of Canova. The most beautiful church in

V., and one of the most beautiful in all Germany, is the *Votiv-Kirche*, built in commemoration of the emperor's escape from assassination 1853: it is a Gothic church, finished 1878, with two towers and spires, and covered with delicate and beautiful tracery and carving. The Imperial Royal Palace is an ancient building, whose various portions were erected at different times. Adjoining the Palace, or forming part of it, are the Imperial Library (410,000 vols.—12,000 printed before 1500—and 20,000 MSS.), the Treasury, the Cabinet of Coins and Antiquities, etc. Among interesting collections are the Belvedere, including the Ambras collection (pictures, sculptures, and antiquities); the Arsenal; the Liechtenstein Gallery, and Count Harrach's collection (pictures), and the Albertina (drawings and engravings), the latter containing the original study of Raphael's *Transfiguration*. The Polytechnic Institution (for instruction in practical science, etc.) is attended by about 1,000 pupils, and in connection with it there is a technological museum. The Univ. (founded 1365) has about 6,000 students on its roll, a staff of more than 400 professors and lecturers, and a library of 225,000 vols. As a school of med. it is celebrated all over Christendom. The principal places of public resort for the people are the gardens of the palace at Schönbrunn, the *Augarten*, and the *Prater*, the latter containing about 2,000 acres, probably the largest park in Europe: the buildings of the great exhibition of 1873 were in it. The V. Observatory was equipped 1881 with the largest telescope which had then been made. V. contains eight or nine theatres, of which the best are in the *Stadt*. At the burning of the Ring Theatre (1881) 570 lives were lost. The manufacture of silk stuffs, also shawl-weaving, are important industries. The manufacture of meerschaum pipes, gloves, bent-wood furniture, and all kinds of fancy leather articles, is very large. Very extensive works were begun 1869 to bring the Danube closer to the city, and improve its navigation. These were completed 1880 at a cost of more than $10,000,000, and have tended to make V. the centre of the ship-trade between e. and w.—as it already is the centre of railway communication. It is now a great grain market. Pop. (1880) city and suburbs 1,078,644—mostly Rom. Catholics; (1900) 1,674,957.

VIEN'NA, TREATIES, ETC., OF: various compacts arranged by representatives of European nations, at this capital, selected for its central position, and for the prominent part which Austria has always taken in the wars of modern Europe. The *first* treaty of V. (1725, Apr. 30) was a mutual guarantee of dominions by Emperor Charles VI. and Philip V. of Spain; besides which, the former agreed to aid in the recovery of Gibraltar from Britain, and to aid the Pretender in supplanting George I. of England, in consideration of Philip guaranteeing the Pragmatic Sanction. The *second* treaty (1731, Mar. 16) was a joint guarantee of the Pragmatic Sanction by George II. of Britain and the states of Holland. The *third* (1738, Nov. 18) was a similar guarantee by Louis XV. of France.

in consideration of the reversion of Lorraine and Bar (to be given meantime to Stanislas, ex-King of Poland), as well as a settlement of the Polish succession dispute, and a rearrangement of the possessions of Austria, Spain, and Sardinia, in Italy. The *fourth* treaty (1809, Oct. 14) was between France and Austria, after the battle of Wagram and the armistice of Znaim, by which Austria agreed to resign some districts on the w. border of the archduchy to Bavaria; Goritz, Friuli, Trieste, Carniola, and parts of Croatia, Carinthia, and Dalmatia, o France, these provinces to be formed into the govt.-gen. of Illyria; some districts of Upper Lusatia to the king of Saxony; w. Galicia, with Cracow and Zamocz, and a share in the salt mines of Wielicza, to the grand-duchy of Warsaw; and the e. corner of Galicia to Russia: a total loss to Austria of 58,170 sq. m., with pop. 3,500,000, and all her seaports.

The next and far the most important meeting of the representatives of European nations was the *Congress of Vienna*, after the first treaty of Paris, for the general settlement of the affairs of Europe. The congress, assembling 1814, Sep. 30, was composed of Czar Alexander I. of Russia, with Count Nesselrode; the king of Prussia, with Hardenberg; Lord Castlereagh, and afterward the Duke of Wellington, representatives of Britain; Prince Metternich for Austria; Count Talleyrand for France; as well as representatives of Spain, Portugal, Sweden, Rome, Germany, and all the other minor powers who were interested personally in the deliberations—the total number convened being about 500. But the representatives of the minor states, who had expected a species of European parliament, to which all would be admitted, were sadly disappointed by the preliminary resolution of the great powers to constitute two committees, one of which would deliberate on the affairs of Germany; and the other, composed of the representatives only of Austria, Prussia, Russia, and Britain, would discuss the affairs of Europe generally, and decide respecting partition of the conquered districts (formerly belonging to France and her allies), and the frontier of each European sovereignty. To this latter council, Talleyrand, by the influence of Castlereagh, who early saw the necessity of a counterpoise to the influence of Russia and her follower, Prussia, in the conferences, was admitted (Oct. 5); and three days afterward it was increased by the representatives of Spain, Sweden, and Portugal. The first resolution of the European committee, to rearrange Europe so as to leave the parties directly interested nothing more to do than give their adhesion to the arrangements made for them—an arrogation of sovereignty over all Europe—was loudly exclaimed against; but the congress was one of rulers and *their* representatives, and not of the nations and *their* representatives; so the indignant clamor on all sides was unheeded The points at once and unanimously settled were: the constitution of Belgium and Holland into one kingdom (*the kingdom of the Netherlands*); the annexation of Norway to Sweden; the restoration of Hanover, with a large slice of Westphalia, to the king of Great

Britain; of Lombardy to Austria; and of Savoy to Piedmont. But the questions as to the disposal of Poland, Saxony, and Genoa were not so easily settled. Russia and Prussia, vain of their prominent share in crushing Napoleon, were bent on extravagant aggrandizement—Russia insisting on obtaining the whole of the grand duchy of Warsaw (see POLAND), while nothing less than the whole of Saxony, and some of the trans-Rhenish provinces of Westphalia, would satisfy Prussia; and both significantly hinted at the proximity of their colossal armies, with the view of awing the other powers into compliance. But Castlereagh was not amenable to such influences; and while steadily refusing to yield an iota to such preposterous pretensions, he joined with Metternich and Talleyrand in a secret treaty, offensive and defensive, 1815, Feb. 3, which was cordially acceded to by Hanover, Sardinia, Holland, and Bavaria. The news of this agreement soon leaked out, and produced considerable modification in the pretensions of the northern powers. At last it was agreed that Prussia should obtain a portion of Saxony (now Prussian Saxony), Posen, Cleves, Berg, the greater part of the left bank of the Rhine as far as the Saar, and Swedish Pomerania; and cede East Friesland, Hildesheim, etc., to Hanover; Anspach and Baireuth to Bavaria; and Lauenburg to Denmark: while Poland, except Posen, Thorn, and those parts of the grand duchy which had been (1809) taken from Austria, was to be erected into a kingdom separate from Russia, but under the rule of the czar. Austria recovered the cessions which she had been forced to make 1809, obtained also the Valteltine from Switzerland, and the establishment of collateral Hapsburg lines in Tuscany and Piombino; while Maria-Louisa obtained Parma. The pope was replaced in his former position as a temporal sovereign; the ancient constitution of Switzerland re-established; and Genoa—despite the strongly expressed aversion of its inhabitants—incorporated with Sardinia. The news of Napoleon's return from Elba somewhat hurried the conclusion of these multifarious arrangements, yet the negotiations were not interrupted; Metternich's scheme for a new confederation of the German states (the same which continued till 1866) was unanimously agreed to—the question of mutual indemnities, rectifications of frontier, etc., being subsequently settled (1819, July 20) at Frankfurt, by a territorial commission of representatives of the four great powers. The questions of the slave-trade and of the free navigation of the Rhine and its tributaries were brought up by England, and also satisfactorily settled. Finally a formal treaty (the *fifth treaty of Vienna*) was drawn up and signed, 1815, June 9.

VIEN'NA PASTE: preparation extensively used as an encaustic, though not contained in the Pharmacopœia: it consists of a mixture of equal weights of caustic potash and freshly burned lime rubbed to powder in a warm mortar. To 50 parts of this compound 60 parts of quicklime are added, and the whole kept in a well-stoppered bottle. When required for use, the powder is made into a soft paste with a little spirit, and applied to the part to be cauterized. V. P. is much employed by some physicians in certain affections of the womb; and is one of the best applications to an indurated chancre: see SYPHILIS.

VIENNE, *vē-ĕnn':* department of w. France; bounded n. by the depts. Maine-et-Loire and Indre-et-Loire, w. by Deux-Sèvres, which intervenes between this and the maritime dept. of Vendée; 2,680 sq. m. The Vienne, affluent of the Loire, is the principal river, all the other streams of the dept. being tributary to it: it flows from s. to n., and receives the Clain, Gartempe, and Creuse—of which only the last is navigable. The surface of V. is flat, with a gradual slope toward the n. The country consists of fertile plains, fine pasture-lands, and extensive forests. The climate is soft, temperate, and healthful. Grain is cultivated in greater quantity than is required for local consumption. On an average, more than 21,000,000 gallons of wine are produced annually. In general, however, agriculture is in a backward state. The mineral riches consist principally of iron and manganese, and numerous quarries of building and other stones, including lithographic stones finer and harder than those of Munich. There are cutlery-works and a national arms factory at Châtellerault; forges, blast-furnaces, spinning-mills (both wool and hemp); and manufactories of serges and coarse cloth, paper-works, etc. V. is divided into the five arrondissements, Poitiers, Châtellerault, Civray, Loudun, Montmorillon. The cap. is Poitiers (q.v.). Pop. (1901) 336,333.

VIENNE': town of France, dept. of Isère; on the left bank of the Rhone, 19 m. s. of Lyons by railway. The river Gère passes through the town, and here joins the Rhone, after supplying motive-power to mills and factories. V. is very ancient: it was the chief town of the Allobroges: is mentioned by Cæsar (*De Bello Gallico*, VII. 9), and by Martial, who terms it *opulenta Vienna*. At the time of the Roman emperors, it was the rival of Lyons (q.v.). Besides numerous water-conduits, etc., of Roman construction, there is a temple supposed to have been dedicated to Augustus, which is now used as a museum and contains Roman remains. There are also a Roman arch, remains of a theatre, and an obelisk, called L'Aiguille, 72 ft. high; and the Cathedral of St. Maurice, a stately Gothic building, with much delicate carving. There are manufactures of coarse woolens, and a good trade in wine. In 1312 a council was held here, in which Pope Clement V. pronounced the suppression of the order of the Templars. Pop. (1881) 22,740; (1886) 23,011; (1901) 25,000.

VIENNE', HAUTE: department of France, formerly known as Haut-Limousin; bounded w. by the depts. of Vienne, Charente, and Dordogne; 2,130 sq. m. It is watered by the Vienne and its tributaries—the chief of which is the Gartempe. The surface is mostly level, but traversed by ranges of low hills, of which the Monts du Limousin, which traverse the s. of the dept., rise in their highest summit to 3,000 ft. The Mont de Puy-Vieux, the highest in the dept., is 3,200 ft. above sea-level. The climate is cold, humid, and frequently foggy. The soil is not fertile, and agriculture is in a backward condition; but domestic animals are reared in great numbers. Mines of iron, lead, and copper are worked, and china-clay, of which there is an inexhaustible supply, is largely exported to Russia and America. About 6,000 men are engaged in porcelain-making. It is divided into four arrondissements —Limoges, Bellac, Rochechouart, and Saint-Yrieix; cap. Limoges. Pop. (1881) 349,332; (1901) 381,753.

VIERSEN, *fēr'sen:* prosperous and beautiful manufacturing town of Rhenish Prussia, 18 m. w. of Düsseldorf. V. has extensive manufactures of woolen, damask, silk, and velvet stuffs, and ribbons: these, with dye-works and many other industries, employ thousands of workmen.—Pop. (1880) 20,997; (1890) 22,198; (1900) about 25,000.

VIERZON, *vē-ĕr-zōng':* handsome town of France, dept. of Cher, 48 m. s. of Orleans, 124 m. s. of Paris. In the three communes there are blast-furnaces, forges, and steel refineries, manufactures of porcelain and earthenware, and a trade in cereals and wine.—Pop. (1886) V.-Ville 10,514; V.-Village 6,995; V.-Bourgneuf 1,498; (1901) 23,000.

VIETA, *ve-ā'tâ* (otherwise given VIET, *ve-ā'*, VIETTE, *ve-ĕt'*, or DE VIETTE, and by himself Latinized into VIETÆUS), FRANÇOIS, Seigneur de la Bigotière: eminent French mathematician: 1540–1603, Feb.; b. at Fontenai-le-Comte, near La Rochelle. Of his early life and education we know nothing, and almost all our knowledge of his personal history is from the records of his friend De Thou (q.v.). V., having studied law at Poitiers, began his career as an advocate in his native town, but left there 1567. Later he was at Rennes as councilor of the parlement of Brittany. Having been driven thence by religious troubles, he became a special *protégé* of the Huguenot chief Rohan, who, 1580, recommended him for office. When Henry of Navarre succeeded to the throne of France, V. was a councilor of the parlement at Tours; afterward became a royal privy councilor, and held that post till his sudden death at Paris. He was a zealous Rom. Catholic (though, it seems, he belonged to the Huguenots for several years); and was a strenuous supporter of the doctrine of the divine right of kings. His genius and persevering industry brought him prominently into notice on various occasions. During the war against the Spaniards, V. discovered the key to the cipher which they had adopted for their dispatches (see CRYPTOGRAPHY). The Spaniards, unable to account for the discovery otherwise,

attributed it to magic; and there is a story to the effect that V. was summoned to Rome to defend himself before the pope against a charge of having dealings with the devil. V.'s next prominent appearance was as an assailant of the Gregorian calendar, in opposition to which he published (1600) a 'true Gregorian calendar,' which was considered by his contemporaries inferior to that which obtained the papal sanction.

V.'s chief claim to remembrance is as a mathematician; and though worthy to rank immediately after such men as Newton and Lagrange, the incessant politico-religious turmoil in France during his life, and the fact that all his works printed during his life were set up and distributed at his own expense, have hindered a general recognition of his high merit. His claims are now gaining increasing recognition. He has been entitled the creator of modern algebra, which he established on the footing of a purely symbolical science; he applied his algebra to the extension of trigonometry, discovering the relations of multiple angles; and he extended the ancient process of extracting square and cube roots to the solution of all equations—an extension which, modernized and modified, is now known as *Horner's method*. He proved his mathematical powers by solving problems which had puzzled Apollonius, Regiomontanus, etc.; and was acknowledged by the mathematicians of Belgium and Italy as their master. Most of V.'s works were collected by Schooten, and published by the Elzevirs, Leyden, 1646. Two other works of his have been discovered, the *Harmonicon Cœleste* and the *Canon Mathematicus*, the latter the first table in which the trigonometrical functions of an angle are completely given. Of the first, two MSS. exist; the second was printed and circulated according to V.'s usual fashion, and has long been a bibliographical curiosity; but neither has yet been published.

VI ET ARMIS, phrase *vī ĕt är'mĭs* [L.]: in *law*, with force and arms: in general, with force and violence.

VIEUXTEMPS, *vē-ĕh-tŏng'*, HENRI: violinist and composer: 1820, Feb. 20—1881, June 6; b. Verviers, Belgium. He was son of an instrument-tuner, and in childhood showed marked musical skill—giving concerts in Paris and Vienna at the age of 13 years. From this time until his death he was before the public as musician, teacher, and composer. He made three visits to the United States, the last in 1870 in concerts with Mlle. Nilsson. He died at Mustapha, near Algiers, where he had gone for his health.

VIEW, v. *vū* [F. *vue*, sight, view—from *voir*, to see—from L. *vidēre*, to see]: to examine with the eye; to look on with attention; to consider: N. sight; vision; the whole extent seen; scene; reach of sight; survey; design; purpose; examination: aim; manner of seeing or understanding; intellectuat sight; a pictorial sketch; in *OE.*, appearance. VIEWS, n. plu. opinion on any subject. VIEW'ING, imp. VIEWED, pp. *vūd*. VIEW'ER, n. *-ĕr*, one who views; the superintendent or general manager of a coal-mine

(used chiefly in Great Britain). VIEW'LESS, a. *-lĕs*, that cannot be viewed; invisible. FIELD OF VIEW, the whole extent seen. ON VIEW, exposed to examination, as articles for sale. POINT OF VIEW, the direction from which a thing is seen.—SYN. of 'view, n.': prospect; display; exhibition; intention; opinion; notion; design.

VIGAN, LE, *lĕh ve-gŏng':* small town of s. France, dept. of Gard, on the left bank of the Arre, 45 m. w.n.w. of Nîmes. It has trade in wine, oil, mules, horses, etc.; has coal mines, quarries of lithographic stone, hosiery factories, and tanneries—hides tanned there being known as Vigan hides.—Pop. (1881) 4,209.

VIGEVANO, *vē-jā'vâ-nō:* town of n. Italy, prov. of Pavia; 15 m. s.e. of Novara, 24 m. s.w. of Milan. It stands on rising ground on the banks of the Mora, not far from the Ticino. It is a walled town; has an arcaded market-place, a cathedral, and a castle of the Sforza family, dating from the 14th c.; manufactures silk, linen, and cotton fabrics; and has active trade in grain and wine.—Pop. (1881) 14,794.

VIGIL, n. *vĭj'ĭl* [F. *vigile*, vigil—from L. *vigilĭa*, wakefulness; *vigil*, on the watch: It. *vigilia*]: a keeping watch during the night: devotion performed during the usual hours of sleep: the eve before a festival: forbearance from sleep; watch. VIG'ILANT, a. *-lănt* [F.—L.]: watchful; attentive to discover and avoid danger. VIGILANTE, n. *vĭj'ĭ-lăn'tĕ*, a member of a vigilance committee. VIG'ILANTLY, ad. *-lĭ*. VIG'ILANCE, n. *-lăns* [F.—L.]: forbearance of sleep; watchfulness; attention in discovering and preparing against danger; in *OE.*, guard; watch: ADJ. formed for protection, or for watching the progress of any measure or plan, as a VIGILANCE COMMITTEE.—*Vigil*, in ecclesiastical use, is a preparatory time of devotion, which, by an ancient Christian usage, preceded the more solemn festivals, especially Christmas, Easter, Pentecost, and the principal martyrs' days. In English it was called 'Eve' or 'Even,' a name still retained in *Christmas Eve*, *Easter Even*, *Hallow-e'en*, etc. The observance is traceable in the early ages of the church, and seems to have been fully established in the 4th and 5th c. On the day before the great festivals, the people assembled in great numbers. The night was spent chiefly in the church and in prayer and other devotional exercises; but abuses arose, and these night-watches were suppressed, and certain festivities which had grown up in connection were abolished. The observance of vigils is retained in the Rom. Cath. Church, and with it all the ecclesiastical offices, together with the fast, at least in the great vigils of Christmas, Easter, Pentecost, Saints Peter and Paul, Assumption, All Saints, etc.; but all the other details of the celebration have fallen into disuse. In the Anglican Prayer-book, the 'vigils or evens' of the chief festivals commemorative of the Lord Jesus, of the Virgin Mary, and of the Apostles are retained in the calendar, though without special services or other celebration.—See Blunt's *Annotated Common Prayer*.

VIGNETTE, n. *vĭn-yĕt'* or *vĭ-nĕt'* [F. *vignette*, a flourish, a head-piece—from *vigne*, a vine—from L. *vinĕa*, a vine—*lit.*, a little vine, the first vignettes having been adorned with borders of vine-leaves and grapes]: in *Gothic arch.*, a running ornament or embellishment of vine-leaves, tendrils, etc.: in *books*, the small engraved embellishment, illustration, or decoration that precedes the title-page or chapters of a book, etc., originally bordered with a scroll of trailing plants or the like, hence the name; in general a picture, and specially a photographic portrait, displaying ing the head and upper part of the body only, and having no definite border, the ground shading off insensibly to an even color.

VIGNY, *vēn-yē'*, ALFRED, Comte DE: French poet and novelist: 1799, Mar. 27—1863, Sep. 17; b. at Loches, in Touraine. He was educated at Paris, but joined the army at the age of 16. In 1826 he married a wealthy Englishwoman; and two years later withdrew from the army and applied himself to literature. V. belongs to the romantic school, but is free from their extravagance of style and sentiment. No modern French poet exhibits an equal refinement and delicacy; and scarcely any other has such classical precision and solidity of literary form with such elevation of sentiment. In his dramas he did not reach the same excellence. His principal works are: *Poëmes* (1822), *Poëmes Antiques et Modernes* (1824–26), among which are his famous *Moïse*, *Dolorida*, and *Elva;* also *Cinq-Mars* (1826), historical romance of the time of Louis XIII., greatly admired in France; *Stello ou les Diables Bleus* (1832); *Servitude* and *Grandeur Militaires* (1835)—two very striking and suggestive novels; *La Maréchale d'Ancre* and *Chatterton* (1835)—dramas of considerable merit. Besides these, he published *Consultations du Docteur Noir* (1856). A posthumous work, *Les Destinées, Poésies Philosophiques*, appeared 1864.

VIGO, *vē'gō:* ancient town and seaport of Spain, on the n.w. coast of the Bay of V., about 85 m. n. of Oporto, 486 m.w. of Madrid by rail. Its climate renders it important as a sanitary station; and its position on the slopes of a hill, overlooking a charming bay, and forming the centre of a scene oriental in its wealth of palms, orange-groves, flowers, and orchards, makes it a delightful place of residence Its narrow winding streets and quaint old houses give it picturesqueness. The country in the vicinity is exceedingly fertile, and fruits, grain, wine, and oil abound. The trade of the port—which is also a harbor of refuge—is large and increasing. It is a regular port of call for several international lines of steamers. About 2,500 vesseis, of 300,000 tons, enter and clear annually.—Pop. (1887) 15,044.

The Bay of Vigo has an inland sweep of 20 m., and is 5 m. wide at its mouth. The town has frequently been attacked by the English: by Drake 1585 and 89; by the Duke of Ormond, Rooke, and Stanhope 1702; and by Lord Cobham 1719.

VIGOR, n. *vĭg'ẽr* [L. *vigor*, activity, force—from *vigērĕ*, to be lively or vigorous: It. *vigore:* F. *vigueur*]: vital strength in animals or plants; physical force; strength of mind; energy. VIG'OROUS, a. *-ŭs*, full of strength and life; strong; powerful; energetic; forcible; robust; active; brisk. VIG'OROUSLY, ad. *-lĭ*. VIG'OROUSNESS, n. *-nĕs*, the quality of being possessed of active strength.—SYN. of 'vigor': force; strength; efficacy.

VIHÂRA, *vĭ-hâ'râ:* Sanskrit word for a Buddhist monastery or convent, and in its usual more restricted sense for the 'temple' around which the monastic buildings are grouped. The word which is said to have originally designated the hall or halls where S'âkyamuni, the Buddha, and his followers used to meet has been variously explained, as 'expatiation,' 'recreation,' 'walking for pleasure or amusement,' the place where Buddhists 'walk with sandalled feet,' etc.—See BUDDHISM.

VIJAYANAGAR, *vē-jâ-yâ-nâ-gâr':* town of Brit. India, cap. of the dist. of Vizagapatam, Madras province; former cap. of S. India.—Pop. (1881) 22,577.

VIKING, n. *vī'kĭng* [Icel. *vikingr*, a pirate, viking—from *vik*, a creek, bay, and suffix *-ingr*, of or pertaining to]: one of the piratical Northmen who infested the coasts of the Brit. Islands and of France in the 8th, 9th, and 10th c. This word is quite unconnected with 'king,' being derived from the Scandinavian *vik*, a bay; and this class of marauders were so called because their ships put off, not from the lawful harbor, but from the bay. See NORMANS.

VILAYET, n. *vĭl-â-yet'* [Turkish]: the largest administrative division of the Turkish empire, having at its head a *vali* or gov.gen.; same as *Eyalet* (q.v.), which since 1866 it has superseded.

VILD, or VILDE, a. *vīld:* OE. for VILE.

VILE, a. *vīl* [F. *vil*—from L. *vīlis*, of small price or value, worthless: It. *vile*]: base; mean; worthless; depraved; morally impure; bad; villainous. VILE'LY, ad. *-lĭ*. VILE'NESS, n. *-nĕs*, the state or quality of being vile; baseness. VILIFY, v. *vĭl'ĭ-fī* [L. *facĭō*, I make]: to debase; to degrade or attempt to degrade by slander; to defame. VIL'IFYING, imp. VIL'IFIED, pp. *-fīd*. VIL'IFIER, n. *-fī-ẽr*, one who defames or traduces. VIL'IFICA'TION, n. *fĭ-kā-shŭn*, the act of vilifying or defaming.

VILIPEND, v. *vĭl'ĭ-pĕnd* [F. *vilipender*, to contemn—from L. *vilipendĕrĕ*, to depreciate or despise—from *vīlis*, paltry, vile; *pendo*, I weigh or value]: to despise; to contemn; to depreciate in a paltry way. VILIPEND'ING, imp. VILIPEND'ED, pp.

VILKOMIR, *vĭl-kō-mēr'*, or WILKOMIERZ, *vĭl-kō'mē-ärzh*: town of w. Russia, govt. of Kovno; on the Swenka, 130 m. s.e. of Riga. It was a flourishing town in the 13th c., and continued prosperous till the 17th c. when it began to decline, in consequence of the wars with Sweden, Russia (V. being at that time a Polish town), and the Cossacks. V. contains an ancient church of the 13th c. Flax is exported to Riga.—Pop. (1885) 16,240.

VILLA, n. *vĭl'lâ*, VIL'LAS, n. plu. *-lâz* [L. *villa*, a country-house, dim. of *vicus*, a village]: a country residence; a detached suburban or rural residence of considerable pretensions, standing in grounds of some size. In the time of the Romans, the villa was a cluster of buildings in the country, forming a sort of private town, and the residences of the proprietor, farmer, and servants, and all the necessary offices and other accommodation for the cattle —the gardens, pleasure-grounds, etc ; a house in a town surrounded by a garden or grounds. VILLAGE, n. *vĭl'lăj* [F.—from *villaticus*, pertaining to a country-house or villa]: an assemblage of houses less than a town, but larger than a hamlet. VIL'LAGER, n. *-lă-jĕr*, an inhabitant of a village. VILLAGERY, n. *vĭl'lă-jĕr-ĭ*, in *OE*, a district of villages.

VIL'LA DEL PRIN'CIPE: see PUERTO PRINCIPE.

VILLAFRANCA, *vĭl-lâ-frân'kâ:* small town of n. Italy, prov. of Verona; 9 m. s.w. of the city of Verona; on the left bank of the Tartaro. It was formerly a place of great strength; but is now notable chiefly as the place where was signed (1859, July 11) the treaty of peace between the emperors of France and Austria, which ended the Italian war of that year.—Pop (1881) 4,205.

VILLAFRANCA DE PANADES, *vĕl'yâ-frân'kâ dā pâ-nâ'thĕs* (i.e., V. of the Bakers): town of Spain, prov. of Barcelona; about 30 m. w.s.w. of Barcelona. It contains some very early palaces of the kings of Aragon, not, however, of much interest. V. was founded by Amilcar, and was the earliest Carthaginian settlement in Cataluña.—Pop. (1887) 6,972.

VILLAIN, n. *vĭl'an* [F. *vilain*, a boor, a rascal—from mid. L. *villani*, the inhabitants of *villæ*, or country estates, who could be sold with the land (see VILLA)—the peasants under the feudal system being held in supreme contempt, led to the bad sense of the word in modern language]: a vile, wicked person; a man extremely degraded or depraved, and capable or guilty of great wickedness. VIL'LAINOUS, a. *-ŭs*, proceeding from an extremely depraved mind; very wicked; vile; in *OE.*, sorry. VIL'LAINOUSLY, ad. *-lĭ*. VIL'LAINOUSNESS, n. *-nĕs*, the state or quality of being villainous. VIL'LAINY, n. *-ĭ*, extreme wickedness; any crime proceeding from an extremely depraved mind; a crime. VIL'LANIES, n. plu. *-ĭz*, wicked actions. VILLEIN, or VILLAIN, n. *vĭl'an*, a feudal tenant of the lowest class; a Serf (q.v.); a *villein regardant* was one attached to a manor, while a *villein in gross* belonged to his lord and was unattached to any territory (see FEUDAL SYSTEM: COPYHOLD: SLAVERY). VIL'LENOUS, a. *-ŭs*, pertaining to a villein or serf. VIL'LEINAGE, or VIL'LENAGE, n. *-āj*, state of a villein; lands and tenements held by base service.

VILLANOUS, VILLANY: spellings of VILLAINOUS, VILLAINY.

VILLARD, *vĭl'ĕrd*, HENRY: financier: b. Spires, Bavaria, 1835, Apr. 11. He was educated in the univs. of Munich and Würzburg; settled in the United States 1853; studied law; then engaged in journalism. He wrote an account of the Pike's Peak gold regions 1859; was war-correspondent 1860–65; then European correspondent till 1868. Visiting Germany 1870, he there acted as agent of sundry American financial interests for sale of railroad securities. He returned to this country 1874, as representative of German holders of bonds and stocks, and, visiting Oregon, gained for his German clients control of the Oregon and California railroad and the Oregon Steamship Co., becoming pres. of both. In 1876 he was appointed receiver of the Kansas Pacific railroad; 1879 he amalgamated three railroad and navigation cos., as the Oregon Railway and Navigation Co., and soon afterward obtained control of the N. Pacific railroad, whose pres. he became 1881. The N. Pacific was opened for traffic with much *éclat* 1883, Sep.; but 1884, Jan. 4, V. perforce resigned the presidency under the 'bears'' attack on the property. In 1889-93 he was chairman of the board of directors. He organized (1890) the Edison Gen. Elec. Co., and was its president for 2 years. He died 1900, Nov. 11.

VILLA-REAL, *vēl'yâ-rā-âl'*: town of Spain, prov. of Castellon; 5 m. s. of the city of Castellon, about 3 m. from the Mediterranean. It has wide, straight streets, laid out at right angles; and contains flour and oil mills, woolen factories and brandy distilleries. Pop. about 15,000.

VILLA RICA, *vēl'yâ rē'kâ:* city of Brazil, cap. of the prov. of Minas Geraes; called also Ouro Preto (q.v.).

VILLARS, *ve-lâr'*, CLAUDE-LOUIS-HECTOR, DUC DE: French general: 1653, May 8—1734, June 17; b. Moulins, dept. of Allier; of noble family. He studied at the college of Juilly. Later he entered the army as a volunteer, and saw service first in Holland, where, having attracted Louis XIV.'s attention by his daring courage and striking figure, he obtained a troop of horse 1672; served for two years under Turenne in Germany, and after the battle of Seneffe received a regt. of cavalry, when yet in his 21st year. After further service under Luxembourg and Crequi, he returned to Paris with high military reputation. During the next ten years (1678–88) he was employed in diplomatic service, chiefly at the court of Bavaria. In 1688 Louvois appointed him commissary-gen. of cavalry; and in the war which followed the league of Augsburg, placed him at the head of the cavalry in Flanders. He represented France at the court of Vienna 1699–1701, foiling by his vigilance and penetration the tortuous policy of the Austrian ministers. On his return he was employed in Italy under Villeroi; and after brief service under Catinat was for the first time (1702) raised to independent command, when he was sent to succor the Elector of Bavaria, who had taken up arms on the side of France. Toward the close of 1702, V. crossed the Rhine, defeated the Markgraf of Baden at Friedlingen, took Treves,

Traerbach, and Nancy; and early in the following year again crossed the Rhine, traversed the almost impassable defiles of the Black Forest, and debouching from the mountains at Villingen, joined the elector near Dutlingen May 12. His bold and well-conceived scheme for carrying the war into the enemy's country, by advancing on Vienna while so many Austrian troops were employed on the middle Rhine, in Italy, and against Ragotski in Hungary, was foiled by the stupid obstinacy of his colleague, the elector; and after his skill and genius had been tasked to the utmost to keep the Austro-Germans under the Markgraf of Baden and Stirum at bay, and he had been relieved by the return of his ally (who had been defeated by the Tyrolese mountaineers), he reopened his line of communication westward, and, leaving Marsin in command, returned in disgust to France. He was next commissioned to put down the insurrection of the Camisards (q v). V.'s manly moderation and soldierly frankness fairly won over Cavalier, the ablest of the insurgent leaders; and the difficulty was brought to an end or reduced to insignificant proportions. V. was then sent to watch over the n.e. frontier, and took post on the heights of Frousberg, when Marlborough advanced upon him with 110,000 men; but V. had shown such skill and strategy in selection and fortification of his position, and remained so strictly on the defensive, that the great English gen. declined to risk an attack, and retreated; whereupon V. burst into Alsace, captured the enemies' reserves of supplies and artillery, and advanced to Rastadt and Stuttgart. In 1709 V was severely wounded at the beginning of the battle of Malplaquet (q.v.). In 1711 he returned to his post, headed the last army that France could raise, and with it fell upon the British and Dutch under Albemarle, intrenched at Denain (1712, July 24), carried their intrenchments sword in hand, and captured most of them; he then turned on Prince Eugene, and drove him to Brussels. This series of magnificent successes saved the honor and even the national life of France, and brought about the peace of Rastadt (see UTRECHT), which V. signed as plenipotentiary, 1714, May 6. After the peace he became, at court, the principal adviser on military affairs and foreign policy; but was finally supplanted by Fleury. The outbreak of war 1732 brought the old hero from his retirement, and with the title of 'Marshal-gen. of the Camps and Armies of France' he headed the French force in the Milanese. The campaigns of 1733,4 showed that the years had left V.'s military genius and spirit untouched. On his return to France he fell ill at Turin, and died there. V. was the last of the great military geninses of the French monarchy, and was wholly free from the restless anxiety for *éclat* which detracts from the merits of so many of them. As a general, he possessed in a high degree quickness of apprehension, skill in disposition, and promptitude (without precipitancy) in action. He was humane, sincere, and self-reliant. His Memoirs have been printed in Holland, and his Autobiography by Anquetil.

VILLARSIA, *vĭl-lâr'sĭ-a:* genus of gamopetalous plants, nat. order *Gentianaceæ*, whose species are widely distributed over the world, and are either aquatic or marsh plants, with entire leaves and yellow flowers. *V. nymphæoides* is common in many parts of Europe, from Denmark to the Mediterranean; and is very abundant in Holland, often covering large tracts of the canals with its beautiful flowers and leaves. It is easily cultivated, and abounds in s. Siberia.

VILLATIC, a. *vĭl-lăt'ĭk* [L. *villāticus*, of or belonging to a country-house; *villa*, a country-house]: in *OE.*, belonging to villages, village or rustic.

VILLEFRANCHE-DE-ROUERGUE, *vēl-frŏngsh'dĕh-rô-ärg':* town of France, dept. of Aveyron; on the right bank of the Aveyron, in a valley; 85 m. n.e. of Toulouse, 390 m. s. of Paris. It contains many interesting houses of the 15th and 16th c.; and, in the market-place, a large collegiate church in the pointed Gothic style of that period. V. has important manufactures of copper-wares and of gray cloths. Iron-works and foundries are also in operation.—Pop. (1886) 8,092.

VILLEFRANCHE-SUR-SAÔNE, *vēl-frŏngsh'sür-sōn':* small town of France, dept. of Rhone; on the Morgon, affluent of the Saône; 18 m. n. of Lyon, on the Paris and Marseille railway; in a district studded with charming country-seats. It consists chiefly of a handsome street a mile and a quarter in length. There are manufactures of cotton goods, and a great trade in wines, horses, cattle, hides, and cloth.—Pop. (1886) 12,157.

VILLEMAIN, *vēl-măng'*, Abel François: French scholar and writer: 1790, June 11—1867, May 8; b. Paris. He was educated at the Lycée Impérial (now the Lycée Louis-le-Grand); was appointed, 1810, extraordinary prof. of rhetoric at the Lycée Charlemagne, which post he soon exchanged for one at the École Normale. Three of his literary essays were crowned by the French Acad. 1812–16—the *Éloge de Montaigne, Avantages et Inconvénients de la Critique*, and *Éloge de Montesquieu*. In 1816 he was appointed to a chair of modern history at the Sorbonne, as assistant to Guizot, from which he was transferred to the chair of eloquence (1816–26). In 1819 he pub. *Histoire de Cromwell d'après les Mémoires du Temps et les Recueils Parlementaires* (2 vols.)—a work written in a calm and liberal spirit. Louis XVIII. took notice of the author, and V. was induced to enter on a political career. The post assigned him was a delicate one—involving a kind of censorship of the press. Under the ministry of Decazes, he held the office of maître des requêtes to the council of state, and 1820 was decorated with the Legion of Honor. Two years later appeared his transl. (with preliminary essay and notes) of the *Republic* of Cicero; and 1825 a drama, *Lascaris, ou les Grecs du XV. Siècle*, and an *Essai sur l'État des Grecs depuis la Conquête Musulmane*. In 1827, having gradually passed over to the ranks of the liberal opposition, he, with Lacretelle and Chateaubriand, was ap-

pointed to draw up the petition of the French Acad. to Charles X. against the re-establishment of the censorship of the press. This resulted in the loss of his appointment as maître des requêtes, and, in consequence, great increase of his popularity as lecturer at the Sorbonne. In 1830 he was sent to the chamber of deputies by the electoral college of Evreux, took his seat among the liberal party, signed the famous address of the 221, and was very prominent in the movements which brought in the constitutional monarchy of Louis Philippe. But he was too sober, unsympathetic, and philosophical, too much a *doctrinaire* of the Guizot school, to be a favorite with the excitable masses; and he sat in the chamber for only one year. In 1831 the king named him member of the royal council of public instruction, of which he became vice-pres. 1832. In the same year he was raised to the peerage. V. held the portfolio of public instruction in the ministries of Soult (1839–40) and Guizot (1840–44); but his health failed under the great labors of his department, and the impossibility of pleasing so many parties—the church, the university, the reds, the liberals, the doctrinaires, as well as the king himself; and he found it necessary to resign. From that time V. applied himself to literature alone. His principal works are: *Cours de Littérature Française, Tableau du XVIII. Siècle, Discours et Mélanges Littéraires* (1823); *Nouveaux Mélanges Historiques et Littéraires* (1827); *Études de Littérature Ancienne et Étrangère* (1846); *Tableau de l'Éloquence Chrétienne au IV. Siècle* (2d ed. 1849); *Études d'Histoire Moderne* (1846); *Souvenirs Contemporains d'Histoire et de Littérature* (1856); *Choix d'Études sur la Littérature Contemporaine* (1857); *La Tribune Contemporaine, M. de Chateaubriand* (1857); *Essais sur le Génie de Pindare et sur la Poésie Lyrique* (1859); besides numerous Essais, Études, Discours, Notices, and Rapports addressed to the French Acad., of which he was perpetual sec. from 1832. V.'s elaborate *Histoire de Grégoire VII.*, nearly finished at the time of his death, was published 1872. He died at Paris. V.'s popularity was immense: he met the literary demands of his time. He was a pleasing writer, discursive in range, eclectic in taste, though not specially original in thought or peculiarly charming in style.

VILLENA, *vēl-yā'nâ:* town of Spain, prov. of Alicante; on the right bank of the Vinalapo; 37 m. n.w. of Alicante. The streets are narrow and winding, and are overlooked by an old castle of imposing appearance. The hills around are clad with vines, and the country is fertile. A great fair takes place here every autumn (Sep. 29—Oct. 5). —Pop. (1887) 11,431.

VILLENEUVE, *vēl-nūv'*, PIERRE-CHARLES-JEAN-BAPTISTE-SYLVESTRE DE: French admiral: 1763, Dec. 31—1806, Apr. 22; b. Valensoles, dept. of Basses-Alpes; of ancient and noble family. V. entered the navy in his 15th year, and passed as capt. 1793. In 1796 he was raised to the rank of 'capt. of division' (equivalent to *commodore*), and commanded the rear division at the battle of

the Nile. In 1804 he was nominated vice-admiral; and in the following year was appointed to the command of the Toulon squadron. Having sailed to the Azores, he encountered a Brit. squadron, under Sir Robert Calder, and a fierce fight ensued, which lasted till dark. On the following morning, neither side cared to renew the engagement (for which V. was abused by *Le Moniteur*, and Admiral Calder was put on trial), and V., unable to reach Brest, returned to Cadiz, where he was strictly blockaded by Nelson. The severity with which he was treated by Napoleon on account of these reverses, and the further indignity of being superseded, goaded V. into the desperate resolve of engaging Nelson before his successor could arrive at Cadiz. The memorable conflict of Trafalgar (see TRAFALGAR: NELSON) was the result. V., whose vessel, the *Bucentaure*, was completely dismasted, was forced to strike his flag; and was made prisoner, and conveyed to England, whence he returned to France 1806, Apr. He stopped at Rennes, with the view of ascertaining the kind of reception he was likely to meet at Paris from the emperor. The result of his inquiries was unfavorable; and on the morning of Apr. 22 he was found dead in bed, with six knife-wounds in his heart, inflicted by his own hand.

VILLENEUVE D'AGEN, *vēl-nŭv' dâ-zhŏng'*, or VILLENEUVE-SUR-LOT, *-sür-lō'*: town of France, dept. of Lot-et-Garonne; in a charming valley, 22 m. by rail n. of Agen. The river Lot, which flows through the town, is here crossed by a remarkably bold bridge of a single arch, with span of 118 ft. and height of 59 ft. The town, formerly called Gajac, was completely destroyed in the wars of the early part of the 13th c. When rebuilt it received its present name. A great trade is carried on in wines, prunes, cattle, and iron, and there are manufactures of paper, cloth, table-linen and copper-wares. Pop. (1901) 14,000.

VILLI, n. plu. *vĭl'lī* [L. plu of *villus*, wool or hair]: in *anat.*, minute projections from the surface of a mucous membrane, giving the appearance of a nap of cloth; in *bot.*, long straight hairs on the surface of a plant. VIL'LOSE, a. *-lōs*, or VIL'LOUS, a. *-lŭs*, in *bot.*, covered with long weak hairs; shaggy; in *anat.*, downy; velvety. VILLOSITY, n. *vil-lŏs'ĭ-tĭ*, the state of being covered with *villi*. VIL'LIFORM, a. *-lĭ fawrm* [L. *forma*]: resembling or having the form of *villi*. VILLUS, n. *vĭl'lŭs*, in *anat.*, one of the conical projections of the mucous membrane of the small intestines.

VIL'LIERS, GEORGE: see BUCKINGHAM, Duke of.

VIL'LIERS, GEORGE WILLIAM FREDERICK: see CLARENDON, Earl of.

VILNO, or WILNO, *vĭl'nō* (often written VILNA): government in w. Russia, bounded w. by Poland, from which it is separated by the Niemen; e. by the govts. of Vitebsk (from which it is separated by the w. Dwina) and Minsk; 16,320 sq. m. The rivers are the Vilia, Beresina, affluents of the Niemen, and the Disna, which flows n. into the Dwina. The surface is flat, the highest part being only

1,100 ft. above sea-level. The soil, in some places very fertile, consists mostly of clay and sand. Marshes abound, and there are about 400 small lakes. The woods which cover the marshes are the great source of wealth: the principal trees are fir and pine, and the timber is floated down the Niemen and Dwina for export, and used in the interior for ship-building, etc. The climate is mild. There are many manufactories; but agriculture is the principal industry, and fairs are numerous and important. Pop. (1883) 1,223,260; (1897) 1,591,912.

VIL'NO, or WIL'NO (often written VILNA): city of w. Russia, cap. of the prov. of V.; on the Vilia; 436 m. s.w. of St. Petersburg. Its cathedral and its imperial palace are fine buildings. There are numerous religious edifices, among which are a mosque, several synagogues, and Lutheran meeting-houses. Its univ., founded 1576, was closed 1832 for political reasons: the astronomical observatory and its medical acad. are the only departments remaining in activity. V. has scientific societies, medical, archæological, etc., of wide fame; also a museum of valuable antiquities. The principal articles of trade are timber and grain. Its manufactures are unimportant. The city is growing rapidly. The people mostly are Poles and Rom. Catholics; though the Jews now form more than one-third of the pop. Pop. (1883) 93,760; (1897) 154,532. V. is a place of ancient historical re-nown: it was made the cap. of the Grand Duke of Lithuania 1323.

VIM, n. *vĭm* [L., accusative of *vis*, strength, force]: vigor; energy; force (*colloq.*).

VIMIERO, *vē-mē'ā-ro*, or VIMIEIRA, *vē-mē-ā'ē-râ:* town in Portugal, dist. of Lisbon, province of Estremadura; near the Atlantic coast; 7 m. n. of Torres Vedras. It is memorable for a battle here, 1808, Aug. 21, between the French under Junot and the English under Wellington, in which the English were victors. The convention of Cintra, Aug. 30, in which the French agreed to evacuate Portugal, was due to this victory.—Pop. (1890) 1,800.

VIMINAL, a. *vĭm'ĭ-năl* [L. *viminālis*, pertaining to osiers—from *vimen*, a pliant twig; *viĕō*, I bind]: pertaining to or consisting of twigs. VIMINEOUS, a. *vī-mĭn'ē-ŭs*, made of or furnished with twigs or flexible shoots.

VINACEOUS, a. *vī-nā'shŭs* [L. *vinum*, wine]: belonging to wine or grapes; of the color of wine.

VINAGO, *vī-nā'gō:* genus of fruit-pigeons, family *Columbidæ*, the members of which have a comparatively stout solid bill, laterally compressed: with a hard, hooked, and inflated tip; the tarsi short; feet large, and formed for perching or grasping. The species, of which not many are known, are natives of tropical Asia and Africa: they inhabit forests, and are shy and timid.

VINAIGRETTE, n. *vĭn-ā-grĕt'* [F.—from *vinaigre*, vinegar—from *vin*, wine; *aigre*, acid, sour]: a small box or bottle (the inner cover of which is perforated) for containing a bit of sponge saturated with aromatic vinegar or the like, used to stimulate or refresh by the sense of smell.

VINAROZ, *vē-nâ-rōth':* town of Spain, province of Castellon de la Plana; on the coast of the Mediterranean; 83 m. n.n.e. of Valencia. Ship-building is carried on, and there are active fisheries. The bay is open and unsafe. Pop. (1887) 9,851; (1900) 10,500.

VINASSE, n. *vĭ-năs'* [F. *vinasse,* dregs of pressed grapes—from L. *vinacea,* a grape-skin—from L. *vinum,* wine]: the potash obtained from the residue of a wine-press; also, the liquor remaining in a still after the process of distillation.

VIN'CA: genus of plants of the nat. order *Apocynaceæ:* see PERIWINKLE.

VINCENNES, *vĭn-sĕnz':* city, cap. of Knox co., Ind.; on the Wabash river, and on the Cleveland Cincinnati Chicago and St. Louis, the Evansville and Terre Haute, the Indianapolis and Vincennes, and the Ohio and Mississippi railroads; 51 m. n. of Evansville, 58 m. s. of Terre Haute. It is on a sandy plain above high-water mark, its site rising to a picturesque plateau under high cultivation, on which are three of about 800 mounds in Knox co., which, as remains of a former civilization, have attracted wide scientific interest. The city has improved water-works, gas and electric light plants, and street railroads; manufactures paper, lumber, flour, starch, foundry and machine-shop products, woolen goods, and wooden-ware; and ships grain, pork, and cattle. There are extensive coal mines in the vicinity. V. contains 3 national banks (cap. $300,000); court-house; 4 high schools; public library; Rom. Cath. cathedral and 15 Prot. churches; Vincennes Univ., chartered 1807; and 3 daily, 5 weekly, and 1 monthly publications. The city was settled by the French 1702 and was the cap. of the Northwest and Ind. territories 1800-13. Pop. (1880) 7,680; (1900) 10,249.

VINCENNES, *văng-sĕnn':* market-town of France, dept. of Seine; 4 m. e.s.e. of Paris. In reality, V. is merely a great fortress and barracks, noted for its arsenal; and for its school for rifle and artillery practice, at which the Chasseurs de Vincennes and all the best marksmen of the army are trained.

V. owes its historical importance to its castle and park. The chateau, the main object of interest, is rectangular in shape, and dates from the middle of the 14th c. It was surrounded by 9 towers, which were standing till 1808, but of which only one remains—the Donjon de Vincennes, 170 ft. high, with walls 17 ft. thick. The original building dates from the reign of Louis VII., and had its origin in a hunting-lodge, erected here 1137. Philippe-Auguste enlarged it, and stocked its woods with wild animals, sent to him by the king of England. Here Queen Jeanne (wife of Philippe le Bel), Louis le Hutin, and Charles le Bel ended their days. Philippe de Valois caused the old mansion to be demolished, and laid the foundations of the more modern chateau, which, from the middle of the 14th c. till the time of Louis XV., was a royal residence, and the birthplace and place of death of many princely person-

ages. After this time it was used as a prison, and among the famous men who have languished within its donjon were Henry IV., the Prince of Condé, Cardinal de Retz, Mirabeau—who here wrote his translation of Tibullus—and the Duc d'Enghien, who was shot in the moat of the castle by order of Bonaparte. There are extensive barracks, known as the New Fort, built 1848–52, and a Salle d'Armes, with a large collection of all sorts of weapons. In the centre of the Bois de Vincennes, a large tract has been cleared as an exercise-ground for troops, and for rifle and artillery practice. Pop. (1901) 31,405.

VINCENNES, *vĭn-sĕnz'*, F. *văng-sĕn'*, JEAN BAPTISTE BISSIOT, Sieur DE: explorer: 1688, Jan.—1736; b. Quebec. As a boy of 10 years he fought against the Iroquois at Mackinaw, and was commissioned ensign at 13. He rendered valuable service in the Miami country 1704; saved Detroit when attacked by the Fox Indians 1712; then till 1725 was employed in the Miami country and the territory now comprised in the states of O. and Mich.: thereafter he lived at the site of the city in Ind. which bears his name. He joined the expedition against the Chickasaws with a force of Miamis 1836; through the failure of the main force to appear at the rendezvous in the Illinois country, V. and D'Artaguette were compelled to face the whole strength of the Chickasaws. The French repulsed the attack with great loss to the Chickasaws; but V.'s force was induced to desert, and he, with D'Artaguette and a priest, Father Sénat, was burned at the stake.

VINCENT, *vĭn'sĕnt*, JOHN HEYL, D.D., LL.D.: bishop of the Meth. Episc. Chh.: b. Tuscaloosa, Ala., 1832, Feb. 23. Having received an academic education, he began to preach at the age of 18, and after studying theol. 4 years he was admitted into the N. J. Conference 1853. In 1857 he was transferred to Ill., and was pastor of Meth. Episc. churches at Galena, Chicago, and other towns, till 1865. He founded the *Northwest Sunday-school Quarterly* 1865, and the *Sunday school Teacher* 1866; was corresponding sec. of the Meth. Episc. Sunday-school Union and of the Tract Soc. 1868–84, meanwhile editing the *Sunday-school Journal*, which attained a circulation of 160,000 copies. He organized a Sunday-school institute at Chautauqua, N. Y., 1874: this institute was the germ of the Chautauqua Assembly (q.v.), the Chautauqua Literary and Scientific Circle (q.v.), and the Chautauqua College of Liberal Arts (q.v.). Dr. V. was elected bp. 1888. He has published: *Little Footprints in Bible Lands; The Chautauqua Movement; The Home Book; The Modern Sunday-school; Better Not; A Study of Pedagogy.*

VINCENT, *văng-sŏng'*, OF BEAUVAIS, *bō-vā'*, or VINCEN'TIUS BELLOVACEN'SIS: mediæval scholar: b. Beauvais (Bellovacum), France; d. about 1264. He was a Dominican friar, and at the instance of King Louis IX., of whose sons he was tutor, wrote a sort of encyclopedia, *Bibliotheca Mundi*, or *Speculum Quadruplex*, in which is found a good review of the state of philosophy, theology, science, art,

economics, etc., in that age. He was author of several other works, a partial collection of which was printed at Basel 1481. See *Vincentius von Beauvais*, by Schlosser (Frankfurt 1819); *Études sur V. de Beauvais*, by Bourgeat (Paris 1856).

VINCENT, *văng-sŏng'*, OF LÉRINS, *lèh-răng'* SAINT: mediæval theologian: 5th c. He was a monk and priest in a monastery on the island of Lerina, now St. Honorat, one of the Lérins (q.v.) Islands, in the Mediterranean, off Antibes, France—hence his surname *Lerinensis*. V. was a pupil of Cassianus. He appears to have adopted some of the tenets of Semi-Pelagianism. In his one work, *Commonitorium pro Catholicæ Fidei Antiquitate et Universitate*, he first formulated the theory of catholic tradition in the celebrated phrase *quod semper quod ubique, quod ab omnibus*, etc. To V. some writers have credited the authorship of the creed *Quicumque vult salvus esse*, commonly designated the Athanasian creed: other authors of the same age to whom that *symbolum* has been attributed are Hilary, Bp. of Arles, and Vigilius of Thapsus.

VIN'CENT, ST.: Brit. island of the W. Indies: see ST. VINCENT.

VIN'CENT, ST., Earl of: see JERVIS, JOHN.

VIN'CENT, ST., CAPE: see ST. VINCENT, CAPE.

VINCENT, *vĭn'sĕnt* (or VINCENTIUS, *vĭn-sĕn'shĭ-ŭs*), SAINT: Christian martyr: d. about 303. He was archdeacon of Saragossa in Spain, and in the persecution of Diocletian was put to death for the Christian faith at Valencia. The narrative of his martyrdom, called *Passio Sancti Vincentii* (in *Acta Sanctorum* under date Jan. 12), is very ancient, being quoted by Augustine, Prudentius, Paulinus Nolanus, Venantius Fortunatus, and Gregorius Turonensis. It is full of almost incredible details of tortures and miracles.

VINCEN'TIAN CONGREGATION: named from its founder, the Rom. Cath. saint, Vincent de Paul; an association of secular priests, who, though not forming in the strict sense a religious order, are bound by vows, and are especially devoted to the duty of preaching and hearing confessions among the people, particularly the poor. Another object of the V. C. is the direction of episcopal seminaries and other colleges for education of ecclesiastics, as also to direct the annual devotional exercises of the secular clergy, called Ecclesiastical Retreat: see PAUL, VINCENT DE (SAINT). At a somewhat recent enumeration the V. C. numbered more than 700 members, in France, Italy, Poland, the Levant, and Algeria. The members are numerous also in the United States, and branches exist in Ireland and Scotland. The name Vincentian is given sometimes also to the sisterhoods (of which there are several, and of which that of Charity is the most remarkable), which were founded by Vincent de Paul, and even to the Charitable Lay Assoc., better known as the Society of St. Vincent de Paul, which has extensive ramifications

in almost all the countries in communion with the Church of Rome, and which has been the occasion of some restrictive measures in France. See BROTHERS AND SISTERS OF CHARITY: PAUL, VINCENT DE (SAINT).

VIN'CENT OF PAUL, SAINT: see PAUL, VINCENT DE (SAINT).

VINCI: see LEONARDO DA VINCI.

VINCIBLE, a. *vĭn'sĭ-bl* [L. *vincĭbĭlis*, that can be conquered—from *vinco*, I conquer]: that may be overcome or subdued. VIN'CIBIL'ITY, n. *-bĭl'ĭ-tĭ*. VIN'CIBLENESS, n. *-bl-nĕs*, the state or quality of being vincible.

VINCULUM, n: *vĭng'kū-lŭm* [L. *vincŭlum*, a band—from *vincĭō*, I bind]: *literally*, any band or fetter; in *alg.*, a bar or line placed over several quantities in order to connect them together as one quantity, as $\overline{a + b} \times c$.

VINDELICIA, *vĭn-dē-lĭsh'ĭ-â:* in the later Roman empire, a province bounded by the Danube and the Inn, and by Rhœtia and Helvetia. The cap. Augusta of the Vindelici (*Augusta Vindelicorum*), is the modern town of Augsburg.

VINDH'YA MOUNTAINS: see INDIA.

VINDICATE, v. *vĭn'dĭ kāt* [L. *vindĭcātus*, pp. of *vindicārĕ*, to claim, avenge—from *vindex* or *vindĭcem*, a claimant]: to justify; to maintain as true and correct against denial, censure, objection, or accusation; to assert; to prove to be just; to defend with arms; to claim; in *OE.*, to avenge. VIN'DICATING, imp. VIN'DICATED, pp. VIN'DICATOR, n. *-kā-ter*, one who vindicates. VIN'DICA'TION, n. *-kā'shŭn*, the defense of anything; a justification against denial, censure, objection, or accusation; the proving of anything to be just. VIN'DICATIVE, a. *-kā tĭv*, tending to vindicate; in *OE.*, vindictive. VIN'DICA'TORY, a. *-kā'tĕr-ĭ*, tending to vindicate; inflicting punishment; avenging. VIN'DICABLE, a. *vĭn'dĭ-kā-bl*, that can be vindicated or justified. VINDICTIVE, a. *vĭn-dĭk'tĭv*, given to revenge; prompted by revenge. VINDIC'TIVELY, ad. *-lĭ*, by way of revenge. VINDIC'TIVENESS, n. *-nĕs*, the quality of being vindictive; revengeful temper. VINDIC'TIVE DAM'AGES, in *law*, damages awarded, not merely to compensate the plaintiff, but also to punish the defendant.

VINDICTIVE, VINDICTIVENESS: see under VINDICATE.

VINE, n. *vīn* [L. *vīnĕa*, a vine, a plantation of vines; *vīnum*, wine: Gr. *oinos:* Eng. *wine*]: the woody climbing plant that bears grapes (see below); the long slender stem of any plant that trails or climbs. VINED, a. *vīnd*, having leaves like the vine. VINER, n. *vīn'ėr*, in *OE.*, a trimmer of vines. VINY, a. *vīn'ĭ*, abounding in vines; producing grapes. VIN'ERY, n. *-ėr-ĭ*, a vineyard; a hot-house in which vines are grown. VINE-DRESSER, one who dresses and cultivates vines. VINEYARD, n. *vĭn'yârd*, a plantation of vines producing grapes. VINIC, a. *vīn'ĭk*, pertaining to, characteristic of, or derived from wine, as *vinic* acid, a *vinic* flavor. VINOUS, a. *vīn'ŭs* [L. *vīnōsus*]: belonging to or producing wine; having the qualities of wine; also VINOSE, a. *vī'nōs*. VINOS'ITY, n. *-nŏs'ĭ-tĭ*, the state or quality of being vinous. VINTAGE, n. *vĭn'tāj* [F. *vendange*, vintage—from L. *vindēmĭa*]: the yearly crop or produce of the grape; the time of gathering the grapes; the wine produced from the grapes of one season. VIN'TAGER, n. *-tā-jėr*, one who gathers the vine. VINTNER, n. *vĭnt'nėr* [OF. *vinetier*—from *vin*, wine]: one who sells wine. VINE CLAD, a. covered with vines. VINE-DISEASE, a disease of the vine, proceeding either from an insect or from a parasitic fungus.

VINE: any climbing plant, especially if shrubby, as the hop-*vine*, the *vines* of melons; but particularly a plant of the genus *Vitis*, nat. order *Vitaceæ*, having *pentamerous* flowers (5-toothed calyx, 5 petals, 5 stamens), and the petals united into a kind of hood, and deciduous. The most important species is the GRAPE-VINE (*V. vinifera*), from the fruit of which wine and raisins are made. Until the ravages of the phylloxera made it important to secure a more vigorous stock, this was the only species planted, to any extent, in Europe. Owing either to inherent weakness of the plant or to lack of suitable climatic conditions, varieties of this species do not thrive in the United States except in Cal. and possibly a limited area in the south.

The grape-vine has large, angular, lobed, toothed, and more or less hairy leaves. The stems are numerous and branching, very long, and of rapid growth, with many tumid joints, the outer bark readily splitting and peeling off, the woody tissue abounding with vessels of large size, from which, at the seasons of active vegetation, if the branch is wounded or cut across, the sap pours in prodigious quantity. The fruit-stalks, much branched, are opposite to the upper leaves, or in their stead are tendrils. The flowers are small, greenish white, and fragrant. The fruit is a round or oval berry, 2-celled and 4 seeded, varying much in size and color—in the small Corinth or Currant Grape, about ¼ of an inch in diameter; in the largest varieties, more than half an inch; green, yellow, red, purple, and sometimes variegated; but the color is entirely in the outer skin, the juice being always colorless; and while the pulp of the grape is wholesome, nutritious, and gently laxative, the skin is astringent and indigestible. Some of the ovules are often abortive, or even all of them in the fruit of old vines of some varieties, e.g., the seedless Ascalon or Sultana raisins.

The vine attains large size, the stem being sometimes 18 inches in diameter (a vine in Cal. is said to have a diameter of 36 inches), so that the wood, which is very hard and durable, has been used for making furniture, statues, etc. It attains very great age, continuing fruitful for at least 300 or 400 years.

The grape is one of the most valuable of fruits, not only for its use in the manufacture of wine, and as the source from which brandy, vinegar, and tartaric acid are obtained, but also because, both in a fresh and dried state, it forms not a mere article of luxury, but a great part of the food of the inhabitants of some countries. Dried grapes, under the names *raisins* and *currants*, are a considerable article of commerce Fresh grapes are commonly eaten with bread in Syria, and some other countries in which they abound The usefulness of some varieties of the grape is increased by its ability to keep fresh for many weeks if stored in a cool airy place. The number of varieties described in works on the culture of the grape and in the catalogues of nurserymen is already among the thousands; and many new kinds, obtained from seed and by hybridization, are introduced every year. Under the name *Ampelography* [Gr. *ampelos*, a vine], this subject has been elevated by German writers almost to the rank of a science.

It is doubted of what country the grape-vine is a native, nor is it known at what time—certainly very remote—its cultivation was first introduced into s. Europe. It is now found wild in parts of Europe, but is rather naturalized than truly native. It seems probable that it is indigenous in the hilly countries south of the Caspian sea, where it is very abundant and luxuriant, climbing to the tops of the loftiest trees, and producing large bunches of delicious fruit.

The cultivation of the grape and the making of wine are of most remote antiquity, as appears from the Scripture history of Noah, and from many passages of the most ancient authors. The mythological fable of the marches of Bacchus relates to the extension of the culture of the vine from Asia into Europe. The earliest records of the manner of cultivating the vine are by the Roman authors Virgil and Columella. The vine was introduced into s. France probably as early as into Italy; it is said to have been brought to Marseille by the Phocæans, about B.C. 600, and its cultivation was early coextensive with civilization in all the countries near the Mediterranean. In Italy, so much of the land was occupied by vineyards that Emperor Domitian, fearing a scarcity of corn, issued a restrictive or prohibitory edict, A.D. 81, which continued long in force, through fear that the abundance of fine wine might tempt the barbarians of the north to invade the country. The vine was introduced into s. Germany about B.C. 3d c. Augustus preferred the Rhætian wine to all other. The first vineyards on the Rhine and Moselle were planted by the Emperor Probus A.D. 281. Under the Merovingians, the culture of the vine extended greatly in France and Germany. Charlemagne derived consider

able revenue from the vineyards even of the n. parts of his empire. The Huns who remained in a number of settlements on the Rhine, after the expedition of Attila into Gaul, 451, brought thither from Pannonia the arts of cultivating the grape, and of making wine; and Hunnish grapes and Hunnish wine were long in high repute. In the middle ages, the monks were the first to plant vineyards and to make wine, in many parts of Europe.

The cultivation of the vine was introduced into England by the Romans. At the time of the Norman conquest, there seem to have been vineyards in s. and s.w. England, and though they afterward disappeared, successful attempts were occasionally made to re-establish them; and one at Arundel Castle in Sussex yielded, about the middle of the 18th c., large quantities of wine. Of late years, the cultivation of the vine has much increased in s. England, in gardens, on the walls of suburban villas and of cottages, but chiefly for the fresh fruit, though wine of moderately good quality is made in small quantities for domestic use.

The vine is a hardy plant, so far as endurance of severe winter-frosts is concerned; but it requires for the ripening of its wood, as well as of its fruit, a considerable summer-heat continued for several months. A very moist climate is unsuitable to it. It produces abundant fruit in warm climates, such as India; but the juice passes too rapidly into acetous fermentation to be used for making wine.

In Europe, the cultivation of the vine forms an important branch of rural economy as far n. as Coblenz on the Rhine; but in some countries, particularly Greece and the Ionian Islands, raisins are the chief part of the produce of the vineyards.

The cultivation of the vine was early introduced by the Spanish and Portuguese into the Azores, the Madeira and Canary Isles, and America. The first vines were carried to the Cape of Good Hope by the Dutch 1650; but while the wines of Madeira and those of the limited district of Constantia at the Cape of Good Hope have long had high celebrity, and those of Canary and Teneriffe have been imported in considerable quantities into Europe, it is only of late that much attention has been given to cultivation of the grape in the other parts of Cape Colony.

The early settlers of the n. portion of the United States found grapes growing wild, but for a long time little attention was given to their cultivation. From about 1620 in Va. and 1683 in Penn., many efforts, which resulted in failure, were made to grow European varieties; but about 1771 the cultivation of these sorts was successfully established on the Pacific coast. With two exceptions the Amer. varieties now under cultivation have been originated since 1820; and as late as 1850 there were only 6 or 8 varieties supposed suitable for general cultivation. The first marked success was with the Catawba, which came into notice about 1835, and which, though lacking in hardiness, was extensively planted. Nearly all the varieties now grown have been originated since 1860

Besides *V. vinifera*, produced in Cal., the species of grapes grown in the United States are as follows: *V. labrusca*, the n. Fox grape, native of the Alleghany Mountain region, and found from Canada to S. C.—the source of more cultivated varieties than any other native species; among these are the Catawba, Concord, Hartford Prolific, and other popular sorts: the foxy flavor of the original largely disappears when varieties are brought under cultivation; *V. riparia* (with which *V. cordifolia* is often confounded), the Frost grape, from which we have the Elvira, Clinton, and Taylor; *V. æstivalis*, the Summer grape, from which have come the Cynthiana, Herbemont, and Norton's Virginia; *V. rupestris*, known in Mo. and Tex. as the Sand grape and Sugar grape; *V. vulpina*, or *rotundifolia*, the s. Fox grape, from which have come the several varieties of the Scuppernong. A large number of hybrid varieties, many of great value, have been originated. Some varieties succeed over a large area and under widely differing conditions of soil and climate; but many sorts valuable in certain circumscribed localities do not thrive elsewhere. There is, however, little difficulty in finding kinds of good quality and a sufficient degree of hardiness for any portion of the United States. The following are among the most popular varieties: *Black Grapes*—Concord, Hartford Prolific, Moore's Early, Wilder, and Worden; *Red Grapes*—Agawam, Brighton, Catawba, Delaware, Salem, and Vergennes; *White Grapes*—Diamond, Lady, Martha, and Niagara; *Foreign Grapes*—Black Hamburg, Flaming Tokay, and White Frontignan.

As seedlings do not reproduce the parent variety, but often differ widely from it, they are grown only to procure new sorts or to obtain hardy stocks on which to graft the more delicate European kinds. Propagation is effected by cleft-grafting (see GRAFTING), layers, or cuttings. Grafting is to be done just before cold weather sets in, and at a few inches below the surface of the ground. The soil is to be pressed around the graft to its upper bud, and a small inverted flower-pot placed over it so that the scion may not be loosened when the soil, which must be piled around and upon it in sufficient quantities to prevent freezing, is removed in the spring. This method often fails, but when successful it secures vigorous growth and very early fruitage. It is valuable particularly for testing new sorts and for utilizing strong bearing vines which yield a poor quality of fruit. In Europe whip-grafting of varieties of *V. vinifera* upon roots or cuttings of American sorts—principally varieties of *V. riparia*, which are not liable to injury by the phylloxera (see PHYLLOXERA)—is very extensively practiced. In this country large quantities of vines are grown from layers. In spring the cane from which plants are to be grown is fastened to the bottom of a trench six in. deep. A new plant soon springs from each bud. When these plants have made a growth of 8 to 10 in. the trench is carefully filled with soil. In the autumn the cane is cut between the shoots, and the latter can be transplanted. Somewhat inferior plants can

be obtained by laying down, in July, shoots of the same season's growth, and covering at once with soil. The most common method of propagation of the V. is by cuttings. These are made, in the fall, from well-ripened wood of one season's growth, cut into pieces 6 to 8 in. long (each having 2 or 3 buds), cut off smoothly close to the lower bud, and 1 in. above the upper one. In the spring these cuttings are planted, 3 in. apart, in a trench with a sloping side against which they are placed. The soil must be firmly packed in the lower portion of the trench, which is then to be filled more loosely as high as the upper bud of the cutting, which should be a little below the surface of the ground. After the shoots are a few inches high the trench is to be completely filled. The Delaware, and a few other varieties, will not grow well in this way, but can be started from cuttings only 2 or 3 in. long, each having but one bud. These cuttings are rooted in sand by the aid of artificial heat.

Though the V. will grow in a great variety of soils it thrives best in soil rather light and dry. A granite or limestone formation is desirable; and gently-sloping hillsides, especially if they face the s. or s.w., are more favorable than valleys or level fields. In a wet location the land should be thoroughly underdrained. Deep plowing is essential, and subsoiling is desirable. Moderate quantities of well-rotted stable manure should be incorporated with the soil, and ground bones and fertilizers rich in potash will tend to promote vigorous and healthy growth of the vines. Planting may be either in spring or in fall. For the fruit-garden many growers prefer vines two years old, but where planting is on an extensive scale those one year old are considered best. The distance apart of the vines varies with the character of the variety, from 6 x 8 ft. for the small growing sorts to 10 x 10 ft. for the more vigorous kinds. At the time of planting the tops of the vines should be cut back to 2 or 3 buds, and it is often desirable to shorten the roots. Planting should be carefully done, and during the first two seasons low growing crops, e.g., beans or potatoes, may be grown between the rows; but fertilizers must be liberally used or the other plants will retard the growth of the vines. Whether any other crop is grown or not, sufficient cultivation must be given to keep the soil mellow and prevent growth of weeds and grass. In the fall of the first year the top of the V. should be cut to a single cane with 3 buds. The second season, this cane should be tied to a stake 4 ft. high, the lateral shoots pinched off when about 5 in. long, also the end of the V. when the top of the stake is reached. The third season, a trellis upon which the vines can be trained is requisite: this may be made of posts, reaching 6 ft. above ground, 20 ft. apart, on which are fastened 4 lines of galvanized wire. The fruit borne this season will be on branches from the main stem; but in later years the laterals must be cut back to 3 buds, after the leaves have fallen in autumn, from which will grow the new wood on which fruit will be borne the next season. Summer

pruning consists in pinching back the young shoots on which fruit has started, but which are not intended for bearing canes the next year. This must not be overdone, as it is important to leave foliage enough to shade the fruit and fully to elaborate the sap. If the V. shows tendency to overbear, the fruit should be thinned when it is quite small, care being taken to remove the smallest and most imperfect clusters. Girdling the V. consists in removing from the bearing canes, near the base, a ring of bark $\frac{3}{16}$ in. to $\frac{3}{8}$ in. wide. It is done, at the north, early in July, and hastens the ripening of the fruit about 10 days. The fruit is rendered somewhat softer, and seems more liable to crack; but the size is considerably increased and the flavor is fully maintained. It is to be practiced only on canes which are to be removed the next season. If the best quality is to be secured, the fruit must remain on the V. till it is fully ripe. When the fruit is gathered, the stems should be cut rather than broken. Only the varieties with thick skins can be safely sent to distant markets, and shipments ought always to be in baskets or boxes of thoroughly seasoned wood. In cold regions it is necessary to give the V. protection during the winter. Some varieties require less than others, but where the cold is severe it is well to at least lay the vines on the ground at the approach of winter. Evergreen boughs are useful for covering. Where these cannot be had, 2 or 3 in. of soil may be thrown over the tops. Gravel or sand answers better for covering than clay or other compact soils.

The principal diseases of the Amer. V. are mildew and black-rot. The causes of mildew are supposed to be certain peculiar conditions of the atmosphere, neglect of pruning, lack of mineral elements in the soil, and lack of constitutional vigor of the plant. Dusting the affected foliage every two weeks with flowers of sulphur, when the leaves are wet, is a common remedy. To prevent black-rot the leaves may be sprayed every 10 days, during the growing season, with the Bordeaux mixture as used for preventing the potato-rot (see POTATO-ROT). A preventive of both mildew and black-rot, which is rapidly growing in favor, is the use of paper bags, which are put over the clusters when the fruit is quite small, and fastened around the stems with common pins: the 2-lb. size is generally used. This method is useful also in preventing injury to the fruit by bees and other insects. See OIDIUM—*Oidium Tuckeri.* The chief enemy of the European vine-grower is the Phylloxera (q.v.), which has caused immense losses. The remedies consist in submerging the ground with water 7 or 8 weeks each winter, or the application of chemical insecticides, e.g., sulphocarbonate of potassium, or bisulphide of carbon, in sufficient quantities to reach the infested roots; but these are far too costly for general use. Preventive measures are the planting in soil containing 60 per cent. of sand (an expensive method which can be employed in but few localities), and the grafting of the European varieties on hardy American sorts. The principal enemy of the vine-grower in this

country is the rose-bug, which often proves very destructive by eating the flowers. Hand-picking and dusting with pyrethrum powder are the leading remedies.

The juice of ripe grapes contains considerable *grape-sugar* (see SUGAR), small quantities of a glutinous substance, and of extractive, bitartrate of potash, tartrate of lime, a little malic acid, and other ingredients, suspended or dissolved in water. The rapidity with which it passes into a state of fermentation after being expressed from the fruit, is remarkable.

For grape-culture in the United States, see VITICULTURE: for the making of wine, the wine-trade, the qualities and uses of wine, the different kinds of wine, etc., see WINE. Concerning the other commercial products of the grape, see BRANDY: VINEGAR: TARTARIC ACID: RAISINS: CURRANT.

VINEGAR, n. *vĭn'ĕ-gĕr* [F. *vinaigre*—from *vin*, wine; *aigre*, sour—from L. *vinum*, wine; *acer*, sour]: an acid liquor obtained from wine, cider, beer, and the like, by the acetous fermentation; the form of *Acetic Acid* (q.v.) which is generally preferred for culinary purposes; anything really or metaphorically sour: V. to pour vinegar on; to render sour or acid. AROMATIC VINEGAR, strong acetic acid highly flavored with aromatic substances. VIN'EGARETTE', n. *-ĕt'*, another spelling of VINAIGRETTE (q.v.).—*Vinegar* is a dilute form of Acetic Acid (q.v.) largely manufactured in Great Britain by the fermentation of malt; on the continent of Europe, from low wines which have turned sour; and in the United States from cider. *Malt vinegar*, or, as it is sometimes called, 'British vinegar,' is made by brewing a weak wort from malt exactly as for Beer (q.v.). To 100 gallons of this, at a temperature of 70°, are added 4 gallons of yeast, and well stirred through for 8 or 10 minutes. This mixture is allowed to ferment actively for two days, and is then transferred to the stoving-room; here it is distributed into a number of tubs, which, when filled, are covered with coarse canvas. This room is dark, and is heated by stoves, and the heat is constantly sustained for weeks until the conversion of the wort into V. is complete. The process of acetification is accelerated by introducing into the casks with the wort either the residuary fruit used in making domestic wine, or the footstalks and skins of grapes: this *rape*, as it is called, acts as a kind of ferment. The processes in use vary somewhat in details. Much V. is made also of beer which has become sour; but it is inferior in quality, and lacks the agreeable flavor of malt V. prepared by the above process, which is due to the presence of acetic and other ethers.

An insipid kind of V. is made by means of the Vinegar-plant (q.v.). The V.-plant itself may be produced thus: A solution of a quarter lb. of sugar and a half lb. of molasses in three quarts of water is first simmered, then poured into a jar, covered, and kept in a warm place for six weeks. The liquid becomes V., and on the top there has been formed a scum-like fungus, which is the V.-plant; and by adding a piece of this to a similar solution, the

conversion into V. proceeds in much less time. During the process, the plant thickens by formation of a new layer on its under surface; and by peeling off this layer, and using it in a fresh operation, the plant may be propagated indefinitely.

The greatest manufacture of *wine-vinegar* in Europe is at Orleans, France. Here the wines are sent from all parts when unfit for drinking, and are converted into V. In the manufacture, a large number of casks are used, with openings into each of only two inches diameter. Into each one are poured 100 pints of V. boiling hot; and to this, after eight days, are added 10 pints of sour wine, and this is repeated every 8 days until the cask is full; another 15 days completes the process, and the V. is ready for use. Beech-shavings are much used in V.-making, as they are found to assist in clarifying the liquor by attracting the lees, which settle on them, and leave the liquor clear, in which state it acetifies more rapidly.

According to Ure, a good V. may be prepared by adding to each gallon of a syrup composed of 1¼ lb. of sugar and 1 gallon of water a quarter of a pint of yeast. If kept three days at a temperature of 75° or 80°, it will be sufficiently acidified to allow of being drawn off into the refining-cask, where one ounce of bruised raisins and one ounce of crude tartar are to be added to each gallon of liquor. When the sweet taste has quite disappeared it should be drawn off into bottles, and corked down tightly. It is stated that such V. will contain 5 per cent. of pure acetic acid. V. prepared by these methods contains a large amount of foreign matter, which can be discharged by simple distillation; the acid liquid which comes over constituting what is known in pharmacy as *distilled vinegar*. What is sold commercially as distilled V. is simply acetic acid distilled from wood (see PYROLIGNEOUS ACID), and diluted with five times its volume of water. This constitutes also the V. used by pickle-manufacturers; it is as wholesome as common V., but lacks its agreeable flavor; its preservative powers are much greater, and its cost very much less. V. containing 5 per cent. of the pure acid is the strongest that is ever produced, and is termed *proof vinegar*. There are four kinds manufactured, known in trade by the numbers 18, 20, 22, and 24, the last being the best quality. The strength of any specimen is best ascertained by determining the quantity of anhydrous carbonate of soda which a given weight of it will neutralize, it being recollected that 100 grains of carbonate of soda correspond to 96.2 grains of anhydrous acid. The ammonia test, according to Neligan, serves to distinguish French from English V.: with the French, the color is purplish; with the English, there is either no change, or it is brownish. There is generally a slight turbidity, due to a trace of lime.

As a condiment, V. is an ingredient of a large number of sauces, and of all ketchups and pickles; and though not an essential article of food, its applications in cookery are numberless. Properly used, it is healthful; but to drink

V. freely with the view of reducing corpulency is to run the risk of exchanging slight fulness of habit for chronic dyspepsia.

V. is used in medicine as a cooling astringent; and is beneficial—taken freely in large dilution with water—in hæmoptysis, in hæmatemesis, and in the colliquative sweating of hectic fever. In severe hiccough, it is said that relief is often given by a dose of a wineglassful of V. In cases of poisoning with the alkalies or their carbonates, it is one of the best antidotes. It may be applied also locally in various ways—e.g., to check hemorrhage from the nose, womb, etc. In intestinal hemorrhage, an enema containing V. and cold water may be used with success, especially if the lower part of the intestine be the seat of the bleeding. Sponged in a diluted state (one part to three of cold or tepid water) over the neck, chest, etc., it affords comfort and relief in cases of colliquative sweating. In its character of a refrigerant rather than as an astringent, its local action on the skin is beneficial (tranquilizing and often sleep-inducing) in treatment of most febrile and inflammatory diseases; it should be freely applied, as in colliquative sweats, to the surface of the body, face, and extremities. The heat and pain commonly experienced in sprains are often relieved by local application of brown paper soaked in diluted V., and changed when the feeling of heat returns. It is an important addition to astringent gargles in cases of relaxed uvula and tonsils; and is the best application to the eyes when lime has got within the eyelids. The ordinary dose is from 2 to 4 drams; and when taken as a drink, 3 ounces may be mixed with a pint and a half of water, and taken in the course of the day.

The term *Chili vinegar* is applied to a preparation obtained by infusing half an ounce of cayenne paper in a quart of French V. for ten days, and straining: it is often added to gargles in the proportion of 1 ounce to 8 or 9 ounces of infusion of roses, in cases of relaxed sore throat.

Aromatic Vinegar, known also as *Vinegar of the Four Thieves*, *Marseille Vinegar*, and *Camphorated Acetic Acid*, consists of strong acetic acid, holding in solution camphor and the oils of cloves, lavender, rosemary, and lemons: it is very fragrant and volatile, and must be kept in well-stoppered bottles. It was formerly regarded as a valuable prophylactic of all infectious diseases, but is now used only as an external stimulant, the vapor being applied by a smelling-bottle to the nostrils in cases of fainting.

VIN'EGAR BI'BLE: a Bible printed at the Clarendon Press, Oxford, England, 1717; named from a printer's error in the running head-line of Luke xxii., in which the word 'vineyard' was printed *vinegar*.

VIN'EGAR-PLANT (*Mycoderma aceti*), or 'MOTHER OF VINEGAR'; a fungoid plant in the form of a gelatinous mass, whose surface when exposed becomes covered with a mold (*Penecillium glaucum*), such as is found on old bread: see MOLD. The *Mycoderma* accelerates the conversion of alcohol into acetic acid probably because it absorbs oxygen, and conveys it to the fluid acted on. The same result is secured in the 'quick vinegar process' by exposing the fluid to air as it trickles through shavings. The *Mycoderma* operates best when the fluid contains no more than 10 per cent. of alcohol and is not below 70° of temperature.—See VINEGAR.

VINELAND: borough in Cumberland co., N. J.; on the Philadelphia and Reading railroad; 35 m. s. of Philadelphia. It is in a fruit-growing and farming region; contains 15 churches, high school, several graded schools, public library, 2 public halls, water, gas, and electric light plants; 1 daily, 2 weekly publications; a national bank, a state bank; and has manufactories of shoes, shirts, agricul. implements, foundry products, buttons, gloves and paper boxes. V. was founded by Charles K. Landis 1861, and has from the first been governed on strict temperance principles. The mildness of the climate in winter has attracted residents in a sanitary point of view. Pop. (1880) 2,519; (1890) 3,822; (1900) 4,370.

VINES, *vīnz*, RICHARD: physician and colonist: about 1585–1651, Apr. 19; b. Bideford, Devonshire, England. In 1609, he was sent by Sir Ferdinando Gorges to Maine to explore the country and form a settlement. The settlement was made 1616–7 near the mouth of the Saco river, and the same year V. ascended the river in a canoe as far as Crawford's Notch. He was the first white man to describe the White Mountains. Saco and Biddeford were founded by him and John Oldham, on land granted them by the Plymouth Company. He died at Barbadoes.

VINET, *ve-nā'*, ALEXANDRE-RODOLPHE: Swiss divine, and critic of French literature: 1797, June 17—1847, May 15; b. Lausanne. He received his education in his native city, and was ordained a minister of the Prot. Church 1819. From an early age, he showed a fondness for the study of French literature; and at the age of 20 he was appointed prof. of French language and literature in the gymnasium of Basel. This position he held till 1837, when he removed to Lausanne, to fill the chair of practical theol. in the acad. of that city. This, however, he resigned 1840, when he seceded from the national church, on account of the new constitution imposed upon it in that year. He appears, however, to have continued his lectures; and in 1844 again connected himself with that institution as substitute-prof. of French literature. V. was a leader in forming a constitution for the Free Church of Vaud, organized by seceders from the national church 1845—a secession due largely to the influence of V.'s writings and teachings in favor of the separation of church and state. V. was an eloquent and earnest preacher, clear

and brilliant, rather than a profound theologian; strongly evangelical, yet advocating the utmost liberty and toleration of religious opinion and practice. He wrote largely on literature and on religion, and most of his works have been translated into English. His theol. treatises have much merit, though scarcely of the highest order; but his works on French literature show thorough acquaintance with its history, high critical power, appreciative faculty, and good literary judgment. As a philosophico-religious writer, he has been very popular among the educated religious public on both sides of the Atlantic. His principal works are: *Chrestomathie Française* (3 vols. 1829); *Histoire de la Littérature Française au XVIII. Siècle; Études sur la Littérature Française du XIX. Siècle*, 3 vols.; *Memoire en Faveur de la Liberté des Cultes* (1826); *Discours sur quelques Sujets Religieux* (1831), and *Nouveaux Discours*, etc. (1841—selections from the two works last mentioned have been pub. in Eng. transl. under the title *Vital Christianity*); *Études sur Blaise Pascal, Études Évangéliques*, and *Nouvelles Études Évangéliques*, transl. into Eng. as *Gospel Studies;* etc.

VINEYARD SOUND, *vĭn'yerd:* strait or channel off the s.e. coast of Mass., separating the Elizabeth Islands from Martha's Vineyard. It is about 20 m. long, with average width 4 to 6 m. Vessels to and from Boston and southern ports usually pass through this sound.

VINGT-UN, n. *văngt'ŭng*, popularly *văn-tôn'* [F. *vingt*, twenty; *un*, one]: a game at cards played with a full pack and by any number of persons, each player endeavoring to obtain cards to make up *twenty-one* points—whence the name.

VIN'IC ACIDS: certain acids of the alcohols, formerly grouped separately; now treated among compounds of the alcohols and ethers. Examples of these acids are sulphomethylic or methylsulphonic acid, $CH_3.SO_3H$, and sulphoethylic or ethylsulphuric acid, $SO_4(C_2H_5)H$ (old name *Sulphovinic Acid*—q.v.).

VINIFACTEUR, n. *vĭn-ĭ-făk'tĕr* [F.]: apparatus for collecting the alcoholic vapors that escape from liquids during the process of vinous fermentation.

VIN'LAND—i.e., *Wine'land:* name given to the chief settlement of the early Norwegians in N. America. There are good reasons for believing it to be represented in modern times by part of Mass. and R. I. The first who saw it was Bjarne Herjulfson, who was driven thither by a storm in the summer of 986, when making a voyage from Iceland to Greenland—his father, Herjulf, and Eric the Red being the earliest colonists of Greenland. But Bjarne did not touch the land, which was first visited by Leif the Lucky, a son of Eric the Red (q.v.), about 1000. The latter built a number of wooden houses, which were called *Leifsbúdir* (Leif's bothies?). A German named Tyrker, who accompanied him, noticed the grape growing there, as in his native country; hence Leif called the region 'Vinland.' Two years later, Leif's brother, Thorwald, ar-

rived, and in the summer of 1003 led an expedition along the coast of New England, southward, but was killed the year following in an encounter with the natives. The most famous of the Norwegian explorers, however, was Thorfinn Karlsefne, an Icelander, who had married Gudrid, widow of Thorstein, a son of Eric the Red, and who sailed 1007 from Greenland to V. with a crew of 160 men, remained three years, and then returned; after which no further attempts at colonization were made. Rafn (q.v.), in his *Antiquitates Americanæ*, has published the most complete collection of the evidence which proves the pre-Columbian colonization of America. See Wilhelmi's *Island, Hvitramannaland, Grönland und Vinland* (Heidelberg 1842). Both Rafn and Finn Magnusen are excessively anxious to show that Columbus derived his first hints of a new world from the accounts of these old Icelandic expeditions. Their *amor patriæ* perhaps leads them too far; yet it may be remembered that Finn Magnusen, in one of the early numbers of the *Nordisk Tidsskrift for Oldkyndighed*, established the fact that in 1477 Columbus visited Iceland, 15 years before he undertook his great expedition across the Atlantic; and he may have heard, while there, something of the long-abandoned Vinland. See MASSACHUSETTS—*History:* see also Nordenskiöld in *Nature*, XXVIII; and the accounts of his expedition to Greenland 1883.

VINNITZA, *vĭn-nĭt'sâ:* town of w. Russia, prov. of Podolia; on both banks of the Bug; 137 m. e.n.e. of Kaminetz. It was founded in the 14th c., and has suffered much from the invasions of Tartars and Cossacks. The district is fertile, and supplies material for distilleries. The merchants mostly are Jews.—Pop. (1884) 18,580.

VIN-ORDINAIRE, n. *văng-ŏr'dĭn-ăr'* [F., common wine]: a kind of claret made and commonly used in France.

VINOUS, VINTAGE, VINTNER, etc.: see under VINE.

VINQUISH, n. *vĭng'kwĭsh:* see VANQUISH 2.

VINTON, *vĭn'ton*, ALEXANDER HAMILTON, D.D.: Prot. Episc. clergyman: 1807, May 2—1881, Apr. 26; b. Providence, R. I.; bro. of David Hammond V. He studied at Brown Univ.; graduated in the med. dept. of Yale 1828, and practiced med. in Pomfret, Conn.; entered the Gen. Theol. Sem. in New York 1832, and was ordained deacon in the Prot. Episc. Chh. 1835, priest 1836. He was rector successively of parishes in Portland, Me., Providence, R. I. (1836–42), Boston (1842–58), Philadelphia (1858–61), New York (1861–69), Boston (1869–77). He then retired to his home in Pomfret, and in the winters lectured on divinity in the Prot. Episc. Divinity School, Cambridge, Mass. Dr. V. had great spiritual fervor, and was an earnest upholder of 'low church' principles. He published *Sermons* (2 series); also lectures in a course on *Evidences of Christianity*.

VIN'TON, DAVID HAMMOND: soldier: 1803, May 4—1873, Feb. 21; b. Providence, R. I. Having graduated at West Point 1822, he was commissioned to an artillery regt., but was transferred to the infantry 1823; became chief quartermaster on the staff of Gen. Wool, with rank of maj., 1846, and served through the Mexican war. He was chief quartermaster of the dept. of Texas 1857–61; and was made prisoner of war 1861, Feb., when Gen. Twiggs surrendered to the Confederates; was exchanged after 6 mos., and thereafter was deputy quartermaster-gen. of the army till 1866, when he was placed on the retired list. He was brevetted col. and brig.gen. 1864 for 'faithful and meritorious services.'

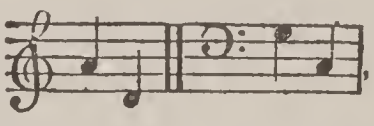
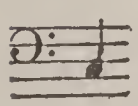
VIN'TON, FRANCIS, D.D.: soldier and Prot. Episc. clergyman: 1809, Aug. 29—1872, Sep. 29; b. Providence, R. I.; bro. of David Hammond V. On graduating at West Point, he was commissioned lieut. of artillery 1830. He served against the Indians in Ga. and Ala., receiving the thanks of congress and a land-grant in Indiana. While stationed at Boston, he studied law and was admitted to the bar 1834. He resigned his commission in the army 1836; studied theology; was ordained deacon 1838, priest 1839, in the Prot. Episc. Chh. He was rector in succession of churches in Providence, R. I. (1840–42), Newport, R. I. (1842–44), Brooklyn, N. Y. (1844–46), New York (1855–72). He declined election to the episcopate of Indiana 1848; was elected prof. of ecclesiastical law and polity in the Gen. Theol. Sem., New York, 1869. He published *Arthur Tremaine, or Annals of Cadet Life; Oration on the Annals of R. I.; Commentary on the General Canon Law.*—Dr. V. was a man of unusual social gifts, and an impressive preacher.

VIN'TON, FRANCIS LAURENS: engineer: 1835, June 1—1879, Oct. 6; b. Fort Preble, Me.; cousin of David Hammond V. He graduated at West Point 1856, but the same year resigned from the army, and entered the School of Mines at Paris, where he graduated 1860. He was commissioned capt. in the 16th U. S. infantry 1861; col. of the 43d regt. N. Y. vols. the same year, and served in the Peninsular campaign; was commissioned brig gen. 1862, and commanded a brigade in the Md. and Rappahannock campaigns. He was compelled, through disability from a wound, to resign from the army 1863, May 5. He was prof. of mining engineering in the School of Mines, Columbia Coll., 1864–77; also, after 1870, prof. of civil engineering; thereafter till his death he was consulting engineer at Denver, Colo. Besides professional papers in technical journals, he was author of *The Guardian* (poem); *Theory of the Strength of Materials.*

VIOL, n. *vī'ŏl* [F. *viole;* It. *viola*, a fiddle or stringed instr.—from mid. L. *vitŭla*, a violin (see also FIDDLE)]: the anc. form of violin, having from three to six strings, played with a bow, and not plucked, as the lute or guitar, which it resembled. VIOLIST, n. *vī'ō-lĭst*, a player on the viol. VI'OLIN, n. *-lĭn* [It. *violino*]: a musical instr. played

with a bow and having four strings; a fiddle (see below). VI'OLINIST, n. *-ĭst*, a player on a violin. VI'OLONCELLO, n. *vē'ō-lŏn-chĕl lō* or *vī'ō-lŏn-sĕl lō* [dim. of It. *violone*, a bass violin]: a large instr. of the violin class, having four strings (see below). VI'OLONCEL'LIST, n. *-lĭst*, player on the violoncello.—The *Viol* is no longer in use, having been superseded by the Violin (q.v.); but it is seen represented on monuments as far back as the close of the 11th c. The belly and back were flat; there were larger bends in the sides than in the violin; and frets, like those of the guitar, were placed on the neck of the instrument, to show where the fingers of the left hand should be placed to produce the desired notes. There was great variety in the number of strings: in Germany, three, four, and five were common; in Italy, six. The strings were tuned by fourths and thirds. Four sizes of viol were in use for treble, alto, tenor, and bass respectively; and they were often played together in concerted music. The smaller viols were called *viol da braccio*, from being held with the arm; the larger, *viol da gamba*, from being placed between the legs. The treble viol was rather larger than the modern violin. The viol da gamba, or bass viol, held its place longer than the smaller viols, but was eventually superseded by the Violoncello (q.v.).

VIOLA, n. *vī'ō-lă:* genus of plants to which the Violet (q v.) belongs.

VIO'LA, or ALTO VIOLA, or TENOR VIOLIN: a large kind of violin, to which the part between the second violin and bass is generally assigned. It has four gut strings, the two lower covered with silvered copper wire. They are tuned by fifths, thus:  , exactly an octave above the violoncello. The compass is from  to , or higher and the music is generally written on the alto clef.

VIOLABLE: see under VIOLATE.

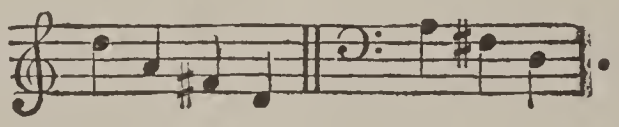
VIOLACEÆ, *vī-ō-lā'sē-ē:* natural order of exogenous plants, of which about 300 species are known, natives of temperate and tropical countries, those belonging to the former generally herbaceous, and to the latter generally shrubby. They have simple leaves with persistent stipules. The calyx consists of five persistent sepals, usually elongated at the base; the corolla of five hypogynous petals, unequal in the sub-order *Violeæ*, and equal in the sub-order *Alsodeæ*. There are five stamens inserted in a hypogynous disk; the filaments prolonged beyond the anthers. The ovary is one-celled generally with many ovules; the style

angle, with an oblique stigma. The fruit is a three-valved capsule with many seeds. The best-known species are the Violets (see VIOLET), prized for beauty and fragrance. Emetic and purgative properties prevail in the order; and some S. Amer. species, particularly of the genus *Ionidium*, yield valuable medicines. See IPECACUANHA: CUICHUNCHUL. The leaves of the Lobolobo (*Conohoria* or *Alsodeia lobolobo*) are used in Brazil as spinach.

VIOLACEOUS: see under VIOLET.

VIO'LA DA GAM'BA: a bass viol held between the legs of the player (see VIOL); an organ-stop with metal pipes of narrow scale, and ears on the sides of the mouths, giving viol- or string-like quality.

VIO'LA D'AMORE, *vī-ō'lâ dâ-mō'rā:* an instrument of the viol tribe, which had fallen into disuse, but was revived a few years ago with a degree of success by Urhan at Paris. It had five or seven strings of catgut, placed and played as in other bow-instruments; but below them, and passing underneath the bridge, were five or seven other strings of metal tuned in unison with them, which vibrated sympathetically when the former were played, giving to the music a peculiar resonant character. The compass was at least three octaves and a half. The strings of Urhan's viola d'amore were tuned in thirds and fourths,

thus: 

VIOLATE, v. *vī'ō-lāt* [L. *violātus*, pp. of *violārĕ*, to treat with violence—from *vis*, power: It. *violare:* F. *violer*]: to use force or strength against; to treat roughly or injuriously; to ravish; to disturb; to break; to transgress; to profane; in *OE.*, to injure; to hurt. VI'OLATING, imp. VI'OLATED, pp. VI'OLATOR, n. *-lā-tĕr*, one who violates. VI'OLATIVE, a. *-lā-tĭv*, tending to desecrate or dishonor. VI'OLABLE, a. *-lā-bl*, that may be violated or injured. VI'OLABLY, ad. *-blĭ*. VI'OLA'TION, n. *-lā'shŭn*, the act of violating; interruption; transgression; outrage; profanation of sacred things; ravishment; rape. VI'OLENCE, n. *-lĕns*, [F.—L.]: highly excited force or action, moral or physical; vehemence; intensity; unjust strength applied to any purpose; injury done to what is entitled to respect: rape: V. in *OE.*, to use violence toward; to coerce by violence. VI'OLENT, a. *-lĕnt* [F.—L.]: urged or driven with force; produced or acting by force; outrageous; unnatural; severe; in *OE.*, extorted: V. in *OE.*, to become violent. VI'OLENTLY, ad. *-lĭ*. TO DO VIOLENCE TO, to outrage; to force; to injure. —SYN. of 'violence, n.': force; attack; outrage; vehemence; injury; infringement; fierceness; turbulence; furiousness; impetuosity; oppression; passionateness; fury; severity; extremity.

VIOLENCE, VIOLENT: see under VIOLATE.

VIOLET, n. *vī'ō-lĕt* [F. *violette*, a violet, a dim. of OF. *viole*—from L. *viŏla*, the violet or wall-flower: It. *viola*]: a plant of the genus *Viola*, or one of its beautiful flowers (see below); one of the prismatic colors: ADJ. of a dark blue inclining to red; of the color of the sweet violet. VI'OLA CEOUS, a. *-lā'shŭs*, violet-colored. VI'OLINE, n. *-lĭn*, a white poisonous principle obtained from the sweet violet. VIOLET POWDER, various perfumed preparations used in the nursery and for the skin.

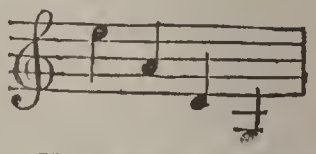
VI'OLET: herbaceous plant of the genus *Viola*, nat. order *Violaceæ*, with short stem, or, if stemless, with short root-stock (rhizome); the leaves alternate, and having long stalks. The flowers have five petals, different in form and size, the lowest having a spur behind. Nearly 200 species of the genus *Viola* have been described, natives chiefly of n. temperate countries. Several species are much cultivated in gardens—some, e.g., *V. tricolor*, for their beautiful flowers; others, e.g., *V. odorata*, for their fragrance. *V. tricolor*, the PANSY, PANSY V., or HEART'S-EASE, is very abundant in fields, meadows, woods, etc., in most parts of Europe, and in n. Asia; and is cultivated in N. America. It is a very variable plant, its flowers differing much in size and color, but is readily distinguished by its large lyrato-pinnatifid stipules. The stem is somewhat triangular, branching, and diffused. The Pansy [F. *pensée*, probably from the drooping attitude of the flower, suggestive of thoughtfulness] is one of the finest of florists' flowers, and no flower has been more improved by cultivation. Another species has of late years been introduced into cultivation, *V. Altaica*, native of Siberia; and by itself, or by hybridization with *V. tricolor*, has become the parent of many garden pansies: in a wild state it has oval leaves and large yellow or purple flowers. The finest garden pansies are preserved and propagated with great difficulty, for unless they receive most careful cultivation they quickly relapse to their wild forms. To satisfy the florists a pansy should have a round, flat, and very smooth edge, the petals thick and velvety, the three lower petals alike in their ground color, the lines or pencillings in the centre bright and distinct, the two upper petals—which always differ in color from the others—perfectly uniform, and the flower should measure at least an inch and a half across. —The SWEET SCENTED V. (*V. odorata*) is common in grassy places throughout Europe and n. Asia. The flowers are either of deep blue color, or more rarely white. Several other species, with pale-blue flowers and destitute of odor, are common in meadows and woody glades in Europe.—The DOG V. (*V. canina*) is one of the most common ornaments of hedge-banks.—N. America has many species one of which, *V. blanda*, is sweet-scented. It has white flowers and is found from Me. to Wis. and Ky. Other United States species of the stemless sort are the Round-leaved (yellow); the Lance-leaved and Primrose-leaved (both white); the Marsh V. and Great-spurred V., the former alpine and n., the latter in central N. Y. and n., rare; the

fleshy-rooted blue or purple Common Blue V., Hand-leaf V., Arrow-leaved, Larkspur, and Bird-foot; and a number of leafy-stemmed species, such as the Dog V., the Long-spurred, the Pale, the Canada, the Yellow Downy, and the Halbert-leaved, with varieties. The Himalayas produce a number of species very similar to those of Europe. The roots of several species of V. were formerly used in medicine. They contain a bitter alkaloid, *Violine*, which acts as an emetic and purgative. The petals of the sweet-scented V. are used for preparation of *Juice* or *Syrup of Violets*, which is employed as a gentle purgative for children, also as a chemical test, being reddened by acids and rendered green by alkalies. The bruised leaves of *V. tricolor* are sometimes used as a remedy for ringworm.—The DOG'S-TOOTH V. (*Erythronium dens canis*) has no connection with this genus, but is a very beautiful flower of nat. order *Liliaceæ*.

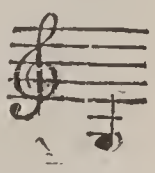
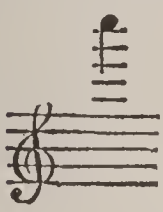
VI'OLET MOSS (*Byssus Iolithus*): by some botanists ranked as a lichen, and by others as a fungus. It consists of simple articulated threads, and spreads over the 'Violet Stones' (q.v.) in the form of a delicate incrustation, at first reddish brown, but in a more advanced stage, yellowish green. It was formerly in use as a popular remedy for feverish cutaneous eruptions.

VI'OLET STONES: certain stones found on high mountains—as in Thuringia, on the Harz Mountains and the Riesengebirge—which, in consequence of being covered with what is called *Violet Moss*, emit an odor like that of violets. They retain this odor a long time, and it is increased by moistening them.

VI'OLIN: stringed musical instrument played with a bow. It consists of a wooden sonorous chest—formed of two slightly arched surfaces, known as the back and belly respectively, united by sides or ribs, and with a curve or hollow on each side in the middle of the length—a neck or finger-board attached to the chest, and strings, fastened at one end of the belly by a tail-piece or projection of wood, and at the other to the head or extremity of the neck, where they can be tightened or slackened at pleasure by turning-pins. The strings thus passing over the belly are raised up from it by a bridge; and on the belly there are two sound-holes opposite each other, of a form resembling the letter *f*, or rather the long *f*. The sounds are produced by drawing a bow across the strings, the upper surface of the bridge being convexly curved, so as to enable the bow to be drawn along each string separately, without coming in contact with the rest (for mode of production of the notes, see SOUND). The modern V. has four strings of gut, the lowest covered with fine silvered copper wire, or sometimes, in the best instruments, with silver or even gold wire.

These strings are tuned in fifths, thus:  ,

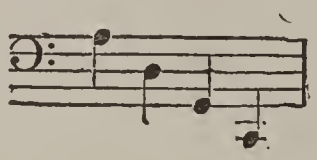
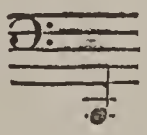
and the highest string is called the first. The bow is held in

the right hand, and the different sounds of each string are obtained by stopping, i.e., pressing it with the finger against the finger-board at certain distances, thus shortening the vibrating portion, and raising the pitch of the sound. Very high notes are produced by the Harmonics (q.v.) of the string, which, instead of being pressed against the finger-board, is touched lightly—the sound resulting from the vibration being, not as in ordinary cases, of the part of the string between the point of stopping and the bridge, but of a harmonic section of it. A peculiar modification of tone is produced by the application of the *mute*, or *sordino*, a little wooden instrument placed on the bridge. A V. or other bow-instrument may occasionally be played *pizzicato* —i.e., with the fingers, as a harp or guitar. The compass of the V. is about three octaves and a half, from  to  , with all the intermediate semitones; but the highest notes are apt to be harsh and squeaking. Though an instrument chiefly of melody, it is to a limited extent capable of harmony by double stops—chords of two notes may be struck together, and three or four notes may be played in arpeggio. Few instruments can compare with the V. in power of expression and execution. It has an unlimited command over a very wide range of sounds, to which any degree of piano and forte, of staccato and legato, can be imparted. In orchestral music there are always two different V. parts for treble and alto, known as first and second V.; and the same is generally the case when the V. is used in concerted music, the usual arrangement of stringed quartette music being for two violins, viola, and violoncello.

Recent writers trace the origin of the V. to the Indian *Ravanastron*, still played by the class of Buddhist monks who go begging from door to door, and traditionally believed to have been the invention of Ravana, King of Ceylon, B.C. 5,000. From the Ravanastron sprang the *Goudok* of Russia and the *Crwth* of Wales—the latter in use before the 6th c.—both seeming to have differed from later instruments of the same tribe in having the upper surface of the bridge flat, so that all the strings had inevitably to be sounded at once. The Viol (q v.) was the more immediate precursor of the violin and of its relatives of deeper pitch, the Violoncello (q.v.) and double bass. The earliest violins seem to have been those of Gasparo di Salo in Lombardy, 1560–1610. During the 17th c. the family of the Amati at Cremona, including Andrew, his sons Jerome and Antonio, and Nicolo, son of Jerome, produced violins whose tone and quality more recent makers have vainly sought to equal. Antonio Stradivari (1649–1737), also of Cremona,

pupil of Nicolo, surpassed the Amati, if that were possible; and for a time the repute of Cremona was kept up by the families of the Guarneri and Ruggieri. Next to the Cremonese violins, in the estimation of connoisseurs, stand those of the Tyrolese makers Jakob Stainer and Matthias Klotz and his sons. Experience has shown that the minutest details of form and proportion, and the material of which each separate part is made, are of vital importance to the quality of the violin.—See Otto's *Treatise on the Structure and Preservation of the Violin;* Sandys and Forster, *History of the Violin;* Fetis, *Notice of Antonio Stradivari,* etc.; Hart, *The Violin* (1875).

VIOLLET-LE-DUC, *vyol-lā'lĕh-dük,* EUGÈNE EMMANUEL: French architect and archæologist: 1814, Jan. 27—1879, Sep. 17; b. Paris. He first devoted himself to the study of mediæval architecture. In 1845, after competition, he, with Lassus, was commissioned to restore the cathedral of Notre Dame, Paris. This great work (completed 1868) after 1854 was under the sole conduct of V. Meanwhile he directed other important works—e.g., the fortifications of Carcassone, the cathedral of Amiens, chh. of Notre Dame at Châlons-sur-Marne, the cathedral of Laon, etc. In the siege of Paris he organized an auxiliary corps of engineers which rendered important services to the defense. He was elected as a republican to the Paris municipal council 1874, and thereafter was prominent in political life as a radical. His writings are very numerous; among them are: *Dictionnaire Raisonné de l'Architecture Française; Architecture Militaire au Moyen Age; Entretiens sur l'Architecture; Histoire d'une Maison; Habitations Modernes.* V. was *collaborateur* with Désiré Charnay in preparing the magnificent work *Cités et Ruines Américaines.*

VIOLONCELLO, *vē-ō-lŏn-chĕl'lō* or *vī-ō-lŏn-sĕl'lō:* large instrument of the violin class, the modern form of the mediæval *viola da gamba* (see VIOL). It resembles the violin in shape, but is about twice its size, and has four gut strings, the lowest covered with silvered copper wire: it is tuned thus, in fifths:  . Its compass extends from  to . Its signature is usually the bass clef, the tenor or treble clef being used for the higher notes. When played it is held with the belly outward, between the player's knees, and rests on the floor by means of a 'standard' or wooden pin.

VIOLONE, n. *vē-ō-lō'nĕ* [It.]: a double bass viol, originally a very large *Viola da Gamba* (q.v.), with 3, 4, or 6 strings: also a pedal organ-stop of 16 feet tone, resembling the violoncello.

VIOMÉNIL, *vē-o-mā-nēl'*, ANTOINE CHARLES DU HOUX, Baron DE: soldier: 1728, Nov. 30—1792, Nov. 9; b. Fauconcourt, France. He entered the army at the age of 12 as sub-lieut.; promoted capt. 1747; served with distinction in the 7 years' war as col., and in the Corsican campaign as brigadier 1768–9. He came to America 1780 as maj.gen. and second in command of the army sent by France to assist the colonies; the French king promoted him lieut.-gen. 1781, and decorated him with the grand cross of St. Louis for his gallantry at Yorktown. He was gov. of La Rochelle 1783–89; he received his death-wound in defending the king at the Tuileries.

VIOTTI, *vē-ot'tē*, GIOVANNI BATTISTA: eminent Italian violinist and musical composer: 1753, Mar. 23—1824, Mar. 10; b. Fontanetto, in Piedmont. From his father, a veterinary surgeon, he learned the rudiments of music, and received lessons in violin-playing from Giovanni 1764. Two years later he was placed under Pugnani at Turin. After holding for a short time the appointment of first-violinist in the royal chapel at Turin, he relinquished that office, in order to travel in Europe with Pugnani. In Berlin, St. Petersburg, Paris, and London, his playing created a *furore*. He visited London first 1792, and was engaged there at Salomon's concerts, and for a time as leader of the orchestra in the King's Theatre. A groundless charge of being a revolutionary agent drove him from England; but after living for a time in retirement at Hamburg, he returned to London, 1795, where he continued to reside until 1818, when he settled in Paris and resumed direction of the opera there. He retired in 1822 with a pension, but, returning to London, entered into ruinous speculations. He died in London.—His compositions include violin concerts and quartettes for violin, tenor, and violoncello, violin duets and solos, and a few pianoforte compositions. His playing was characterized by a vigor of style and purity, as well as brilliancy and elegance, previously unknown; and he has been considered the father of the modern violin school.

VIPER, n. *vī'pėr* [F. *vipère*—from L. *vīpĕra*, an adder, a snake—from *vīvus*, alive; *parĭō*, I bring forth—so called from its bringing forth living young: It. *vipera*]: venomous serpent of several species (see below); a very mischievous or malignant person. VI'PERINE, a. *-ĭn* [L. *vīperīnus*]: pertaining to vipers. VIPERINA, n. plu. *vī'pėr-ī'nă*, a group of snakes. VI'PERISH, a. *-ĭsh*, viperous; malignant. VI'PEROUS, a. *-ŭs*, having the qualities of a viper; malignant.

VI'PER: any venomous snake of the genus *Vipera* and family *Viperidæ* (q.v.). The Common V. or Adder, *V.* (or *Pelias*) *berus*, is found throughout Europe from n. Russia to the Mediterranean, and in many parts of England and Scotland, but not in Ireland. It seldom attains a length of more than two ft. The head is depressed, widening behind the eyes; the gape as long as the head. Like the rest of the family it has a pair of mobile fangs in the upper jaw. The neck is smaller than the back of the head.

From the neck the thickness increases to near the middle of the entire length, and then diminishes to the vent. The tail tapers rapidly to a point. The characteristic markings are almost invariable; but the ground-color varies considerably, from nearly olive, rich deep-brown, or brownish yellow, to almost black. Thus, in England there is the 'black V.': also the 'red,' or the 'blue-bellied,' or an almost white viper with black markings—diversities which have led some naturalists to assign the snakes to distinct species; but *Pelias berus* is the only venomous serpent found in Great Britain. Its bite is attended with pain and serious consequences, but is seldom fatal. The remedies are generally the application of hot olive-oil, and the internal use of olive-oil and of ammonia, or strong stimulants such as brandy taken in large doses. The V. is ovoviviparous, the eggs bursting in the act of parturition, or immediately afterward: the investing membrane is so thin and slight as to be easily torn. The young V. is coiled up so closely in the egg as to appear almost a solid mass; but the moment it is set free it is active, and ready to throw itself into an attitude of defense.

It has often been alleged that in times of danger the young of the V. seek refuge in their mother's open mouth and find temporary protection in her œsophagus. This has been disputed, but complete investigation is lacking. In America, evidence goes to prove that the habit of giving refuge to the young is common with several non venomous species that are viviparous.—There are no vipers in the new world, though the name is often popularly applied to one or more of its snakes.

VIPERIDÆ, *vī-pĕr'ĭ-dē:* family of snakes constituting, with *Crotalidæ* (q.v.), the *Viperina*, or third sub-order of *Ophidia*. The general characteristics of a V. are wide, angular, depressed head, causing the neck to appear small in comparison; short, thick body; and tail tapering suddenly to a point. In some of the largest vipers, the short, unmistakable tail is only two inches in length. The head is mostly covered with scales, rarely plates, or only a few about the eyes and lips, or with extremely fine plates. The scales are carinated, often rough, even spinous. The ventral shields are broad, and the subcaudal plates in two rows. The nostrils are large, and in some species they close with a valve. This highly venomous family of serpents are furnished with a pair of long, curved fangs. In this order the upper maxillary, bearing two isolated fangs firmly fixed to it, is reduced to a mere wedge of bone, which is movably articulated, and by especial muscles rotates or rocks to and fro, and the fang with it. The action is volitional as a whole. The viperine snakes are often said to have 'movable fangs,' though the fangs themselves do not move independently, but only with the bone to which they are attached. Thus, when at rest, the fang, protected by a membranous sheath, lies supine along the jaw; but when in use springs down by the rotation of the maxillary bone, just as a scythe might point downward or horizontally by the movement of the handle. The fang

has a canal in its interior, connected with a poison-gland, whose contents are ejected into the wound made by the fang in the act of biting. Behind the pair of functional fangs, others, in a rudimentary stage, are found, and may even create a wound, though, being as yet unconnected with the poison-duct, they do not convey venom into the wound. The lower jaw has numerous solid teeth of the ordinary form. Formerly the vipers were confounded with colubrine snakes; and even at the present day authorities differ in the arrangement of *genera* and *species*, on account of the forms running so much into each other. Dumeril gives 6 genera and 17 species; Wallace, 3 genera and 22 species; and Gray, 9 genera and 20 species. Strauch gives 3 genera: *Vipera* (with 20 species), *Echis* (with 1 species), and *Atheris* (with 3 species). Those of the family best known are the 'River Jack' of w. Africa, the Horned Viper or Cerastes (q.v.) of n. Africa and w. Asia, the Puff Adder (q.v.) of Africa, the Death Adder of Australia, Russell's Viper and the Carpet Snake of India. The cobra de capello and the Egyptian *Naja haje* also belong here. The V., as above mentioned, are mostly distinguished by their broad, flat, angular head; thick, heavy body; short, tapering tail; rough, carinated scales; and a generally hideous physiognomy, which seems to express their noxious qualities. Nevertheless some have a handsome exterior, and are adorned with dark, rich colorings and patterns. The *Daboia* of India is one of these, and, being of less clumsy form, has been named *Vipera elegans*. The true vipers, or those which have not the nasal fosse, are most largely represented in Africa, which has about 12 species. Europe has 3; India 2. The anomalous Death Adder (*Acanthophis antarctica*) of N. Australia, with its unmistakably venomous look, is included among the vipers, notwithstanding it has a pair of *fixed* fangs like the *Elapidæ*. The largest and deadliest species are found in tropical countries. They inhabit dry, sandy deserts, and are of retiring, sluggish nature. See LACHESIS: ASP: PUFF ADDER: RATTLESNAKE: ETC.

VIPER'S BUGLOSS, *vī'pĕrz bū'glŏs:* plant of the genus *Echium*, nat. order *Boragineæ;* having a calyx with five deep segments, an almost bell-shaped corolla with dilated throat and irregular limb, very long unequal filaments, and a bifid style. The species of this genus are large herbaceous plants or shrubs, rough with tubercles and hairs. Their flowers are often very beautiful. The COMMON V. B. (*E. vulgare*), a large annual plant, is a native of Europe, growing in dry places, frequently in corn-fields, and is a troublesome introduced weed in Va., but rather rare in the n. states. Its flowers are at first reddish, and afterward blue. It derives its name, V. B., from spots on its stem, which somewhat resemble those of the viper—whence the property of healing vipers' bites was ascribed to it. Other herbaceous species are found in s. Europe, N. and S. America, and other parts of the world. Shrubby species are found chiefly in the Canary Islands and in s. Africa.

VIRAGO, n. *vĭ-rā'gō*, plu. VIRA'GOES, *-gōz* [L. *virago*, a bold or manlike woman; an amazon—from *vir*, a man]: a female warrior; a woman of great stature, strength, or courage; a bold, masculine woman; hence, in modern usage, a bold, turbulent, impudent, or shrewish woman; a termagant; also, in *zool.*, a genus of ducks of the sub-family *Anatinæ*, the female of which has a peculiarity of the windpipe which usually belongs to male ducks only. VIRAGINIAN, a. *vĭr-ă-jĭn'ĭ-ăn*, or VIRAGINOUS, a. *vĭ-răj'ĭ-nŭs*, virago-like; termagant.

VIRCHOW, *fēr'cho*, RUDOLF: pathologist and publicist: b. Schivelbein, Pomerania, 1821, Oct. 13. He was a pupil of Johann Müller; graduated in medicine 1843; and became prosector to the Univ. of Berlin 1847. The same year he was commissioned by the govt. to investigate the cause and cure of typhus in Silesia; also, in conjunction with Reinhardt, he founded the Annals of Pathological Anatomy and of Clinical Medicine. The political commotions of 1848 drew him, with many other votaries of science, into the revolutionary vortex. He established a journal, the *Medical Reformer;* also a democratic club, where he distinguished himself as an orator. He was elected to the national assembly, but was not admitted, because he was, in a parliamentary sense, a minor. With the conservative reaction, V. had his journal suppressed, and lost his post, but was elected to the chair of pathological anatomy in Würzburg. His lectures at that univ. were widely popular for his novel views, particularly in cellular pathology. His reputation grew so great that he was recalled by Manteuffel 1856 to Berlin, where he reoccupied the chair of pathological anatomy, and rendered it the most famous in Europe. In 1859, when the liberal cause revived, he became member of the municipal council of Berlin, where he distinguished himself as a reformer of the arbitrary police system; and soon afterward was chosen deputy by the electoral college of Saarbrück, and by two of the Berlin colleges. He soon rose to the leadership of the opposition, and was an effective antagonist of the encroachments made in the name of the royal prerogative. He took the lead, 1863, Jan., in carrying the address in which the ministry were accused of having violated the constitution. Such was the energy of his opposition, that, 1865, June, he was challenged to a duel by Count Bismarck. In 1878 he retired from parliamentary life to apply himself exclusively to science, after having been for years a prominent member of the advanced liberals in the Reichstag.—Among his works are his inaugural thesis, *De Rheumate Corneæ* (1843); *The Colloid Tumors of the Ovaries, and on Cancer* (1847); *Cholera* (1848-9); *Flexions of the Uterus, Scrofula, Tuberculosis, Typhoid Fever* (1850); *Cellular Pathology* (1850); *Amyloid Degeneration* (1853); *Trichiniasis* (1860); *Tumors* (1862); *Cellular Pathology in Its Foundation on Physiological and Pathological Histology* (1871); a notable article *On the Standpoints of Scientific Medicine* (1878); *Of the Veddahs of Ceylon* (1881); and *The Burial-field of Coban* (1883). During

the wars of 1866 and 70–1, V. was active in the sanitary arrangements for the troops in the field. He was elected hon. member of the Royal Med. Soc. of London 1856, and corresponding member of the Med. Soc. of Paris 1859. On his 70th birthday he was presented with a medal of pure gold, weighing nearly 6 lbs., worth $1,700

VIRE, *vēr:* ancient town of Normandy, France, dept. of Calvados; on the right bank of the Vire; 35 m. s.w. of Caen. It stands on a rock, is built of granite, and is surrounded by hills, between which are the celebrated valleys of Vire—*Vaux de Vire* (see VAUDEVILLE). It has an old church dating from the 12th to the 15th c., and ruins of a castle of the 12th c. Its industries are cloth and paper making, and cotton and wool spinning.—Pop. (1881) 6,597.

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